CHAPTER 57

LIST OF EFFECTIVE TEMPORARY REVISIONS

FOLLOWING IS A COMPLETE LISTING OF ALL ACTIVE TEMPORARY REVISIONS (TR'S). TR'S NOT LISTED SHOULD BE REMOVED. THE ATA NUMBER, CONFIG CODE AND PAGE NUMBER IDENTIFIES THE PAGE PRECEDING THE TR.

TR NUMBER	ATA NUMBER	CONFIG CODE	PAGE NUMBER	TR DATE

NONE

CHAPTER 57

WING

LIST OF EFFECTIVE PAGES

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CHAPTER 57

WING

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WINGS - DESCRIPTION AND OPERATION

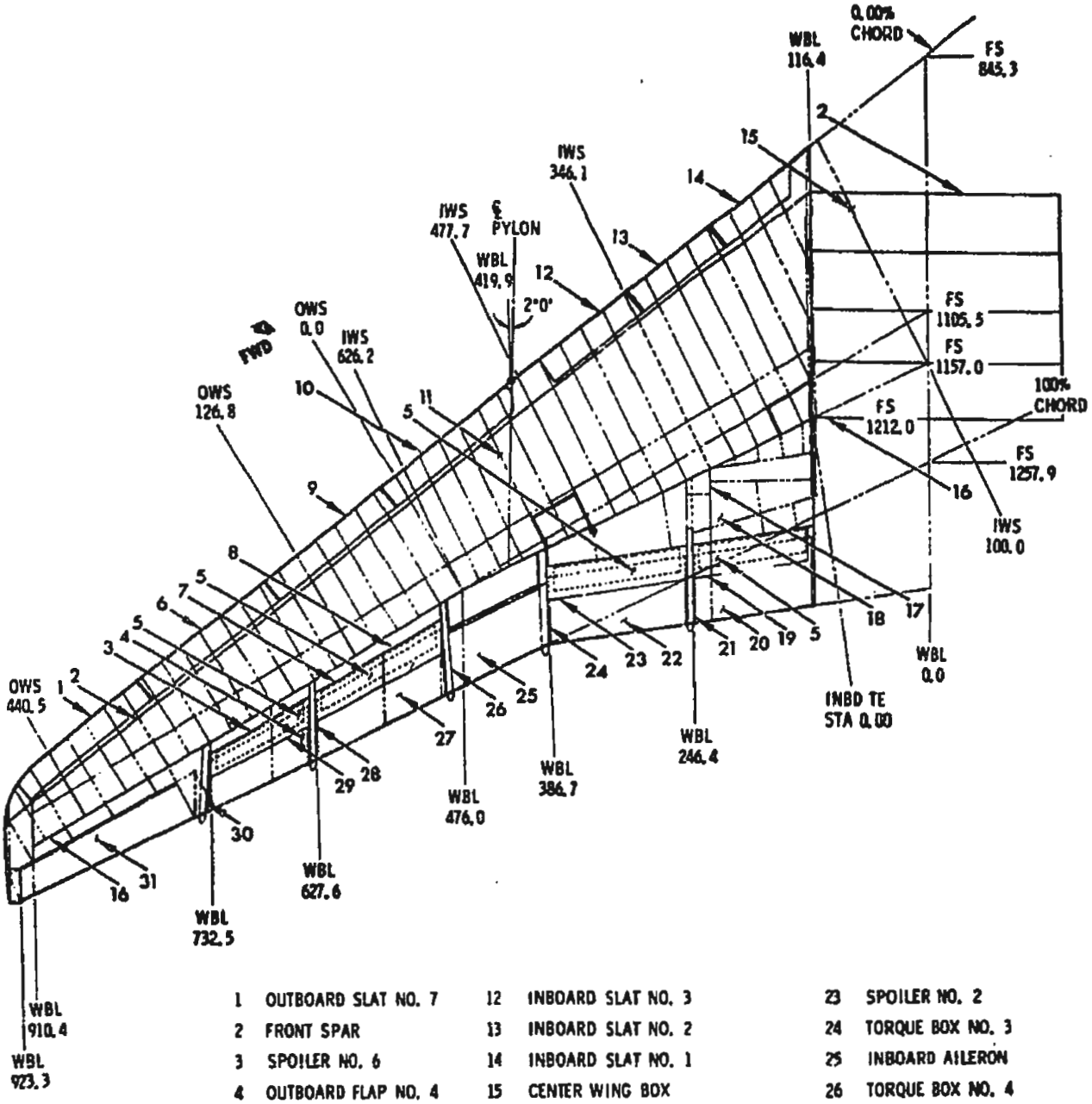
1. General

Each wing provides lift for aircraft, stores fuel, provides support for main landing gear and wing engine.

R Wing structure consists of primary and secondary or auxiliary
R structures. Primary structure includes the main frame of wing,
R consisting of the center wing box and outer wing box. Flap
R panels are primary structure. Secondary structure consists of
R fixed leading edge, trailing edge, and flight control surfaces.

Center wing section is an integral part of the fuselage. Each wing is permanently attached to the center wing section.

Outer wing box structure is a two-spar configuration with chordwise ribs perpendicular to rear spar. Center wing box has a five-spar configuration (front spar, rear spar and three intermediate spars), external rib beams on lower surface, and fuselage floor beam supports as upper external ribs.



1	OUTBOARD SLAT NO. 7	12	INBOARD SLAT NO. 3	23	SPOILER NO. 2
2	FRONT SPAR	13	INBOARD SLAT NO. 2	24	TORQUE BOX NO. 3
3	SPOILER NO. 6	14	INBOARD SLAT NO. 1	25	INBOARD AILERON
4	OUTBOARD FLAP NO. 4	15	CENTER WING BOX	26	TORQUE BOX NO. 4
5	VANE	16	REAR SPAR	27	OUTBOARD FLAP NO. 3
6	OUTBOARD SLAT NO. 6	17	MAIN LANDING GEAR TORQUE BOX	28	TORQUE BOX NO. 5
7	SPOILER NO. 4	18	MAIN LANDING GEAR DOOR	29	SPOILER NO. 5
8	SPOILER NO. 3	19	SPOILER NO. 1	30	TORQUE BOX NO. 6
9	OUTBOARD SLAT NO. 5	20	INBOARD FLAP NO. 1	31	OUTBOARD AILERON
10	OUTBOARD SLAT NO. 4	21	TORQUE BOX NO. 2		
11	OUTER WING BOX	22	INBOARD FLAP NO. 2		

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Wing Diagram
Figure 1

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MAIN FRAME - DESCRIPTION AND OPERATION

1. General

R Main frame of wing consists of center wing box and outer wing
R boxes. Main frame of the wing is nearly similar to primary
R structure of wing (Ref. Fig. 1).

R Outer wing boxes are attached to center wing box which is a part
R of the fuselage. A set of spar fittings positions and bolts
R wing in place. A taper-shimmed, continuous V-joint for each of
R the upper and lower stringers forms a permanent wing connection.

A. Outer Wing Box Structure

R Outer wing box structure (Ref. Fig. 2) consists of front and
R rear spars, upper and lower skin panels, upper and lower
R stringers and ribs. Outer wing box structures extend from
R wing buttock line (WBL) 116.4 to wingtip bulkhead at WBL
R 910.4.

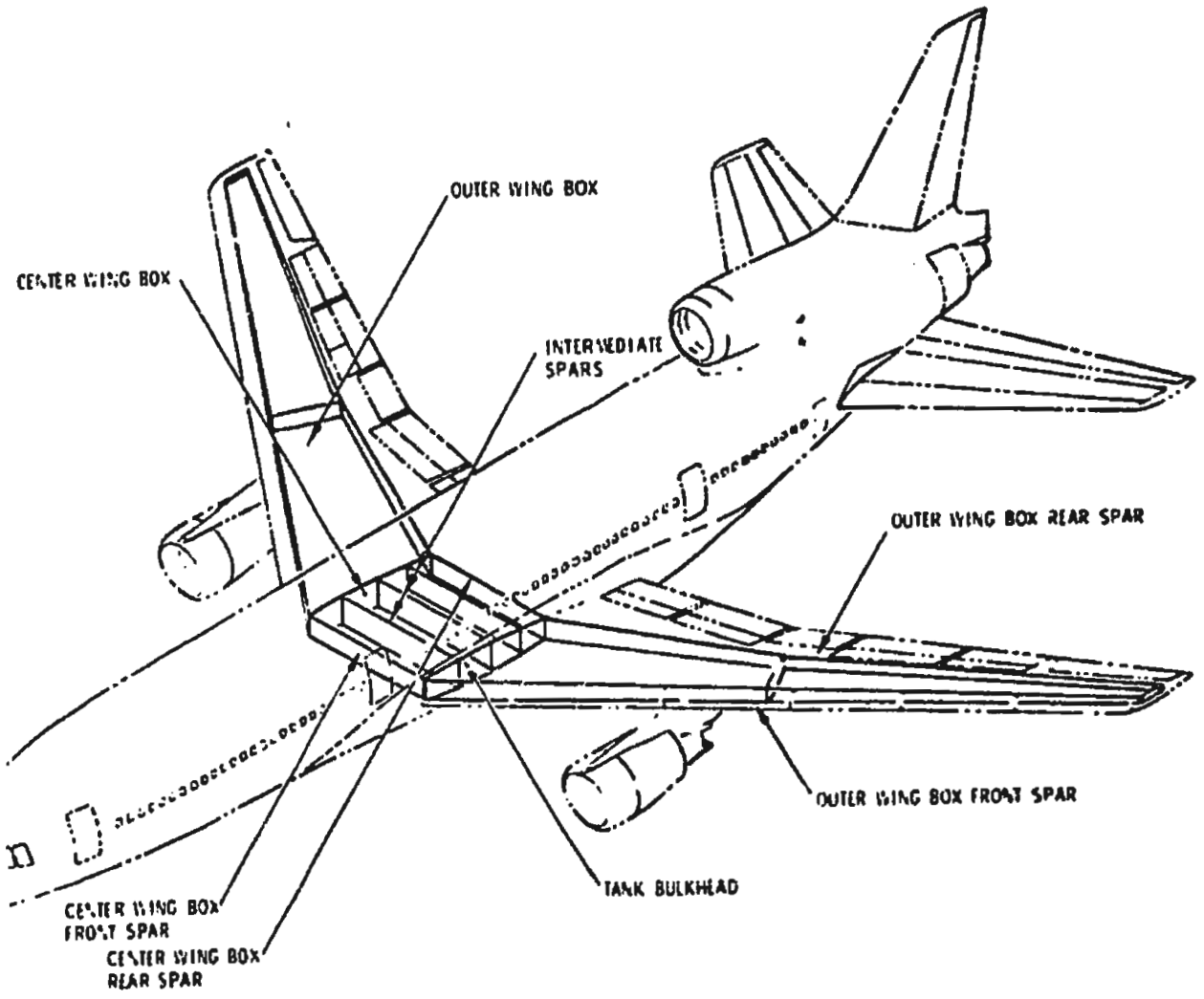
R Outer wing box structure is an integral fuel tank that is
R compartmentalized by bulkhead ribs into separate fuel tanks.
R Inboard tank extends from inner tank bulkhead at WBL 116.4
R to inner wing station (IWS) 477.7. Outboard tank structure
R extends from IWS 477.7 to outer wing station (OWS) 440.5.
R Outboard tank has a fuel-tight bulkhead rib at OWS 126.8 for
R fuel control purposes. Structural surge boxes are located
R in aft inboard corner of each fuel tank area. A vent/surge
R box area is located between outer tank bulkhead at OWS 440.5
R and tip bulkhead at WBL 910.4.

R To prevent intergranular corrosion, all aluminum wing box
R skins, stringers, caps, and webs are sulfuric acid anodized
R and sealed, and are assembled with faying surface sealer.
R Fasteners are installed wet, and parts are coated with a
R two-part polyurethane material. To further assure metal
R protection, all joints are fillet-sealed, and all critical
R fasteners are brush-coated with sealing compound.

R Lower six inches of tank assembly is coated with a second
R coat of the two-part polyurethane material.

B. Center Wing Box Structure

R Center wing box structure (Ref. Fig. 3) includes 5 spars,
R upper and lower stringer-reinforced wing skins, 12 lower
R external beam ribs, and 12 longitudinal floor support beams.
R Lower external beam ribs and floor support beams serve as
R structural components of the wing. Floor beams also support



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Wing Main Frame
Figure 1

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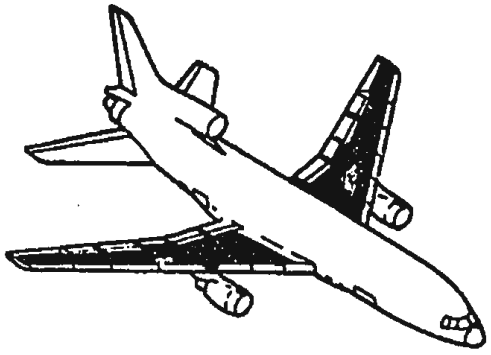
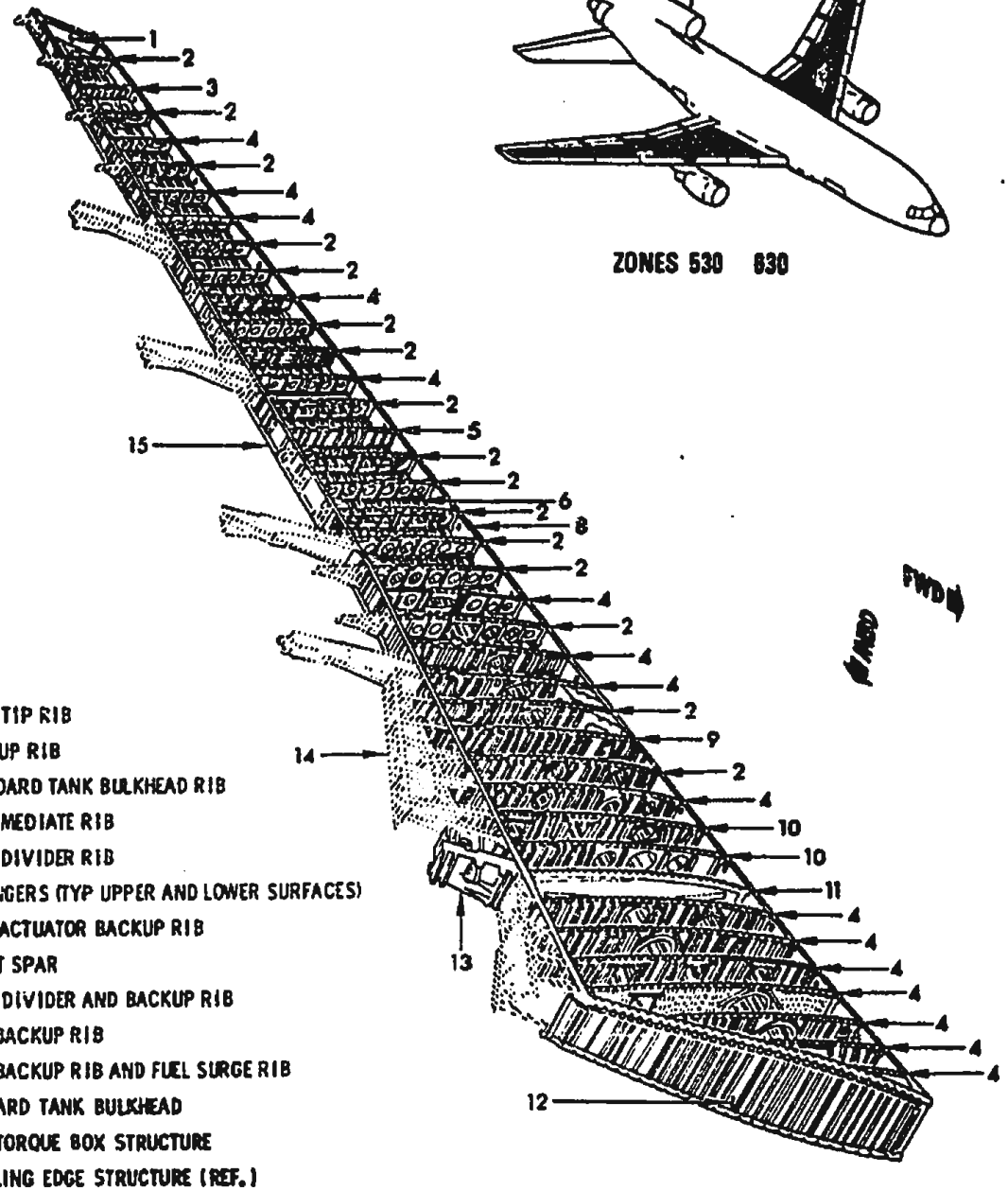


ZONES 530 830



1 WING TIP RIB
2 BACKUP RIB
3 OUTBOARD TANK BULKHEAD RIB
4 INTERMEDIATE RIB
5 TANK DIVIDER RIB
6 STRINGERS (TYP UPPER AND LOWER SURFACES)
7 FLAP ACTUATOR BACKUP RIB
8 FRONT SPAR
9 TANK DIVIDER AND BACKUP RIB
10 MLG BACKUP RIB
11 MLG BACKUP RIB AND FUEL SURGE RIB
12 INBOARD TANK BULKHEAD
13 MLG TORQUE BOX STRUCTURE
14 TRAILING EDGE STRUCTURE (REF.)
15 REAR SPAR

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R
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Outer Wing Box Structure
Figure 2

EFFECTIVITY: ALL

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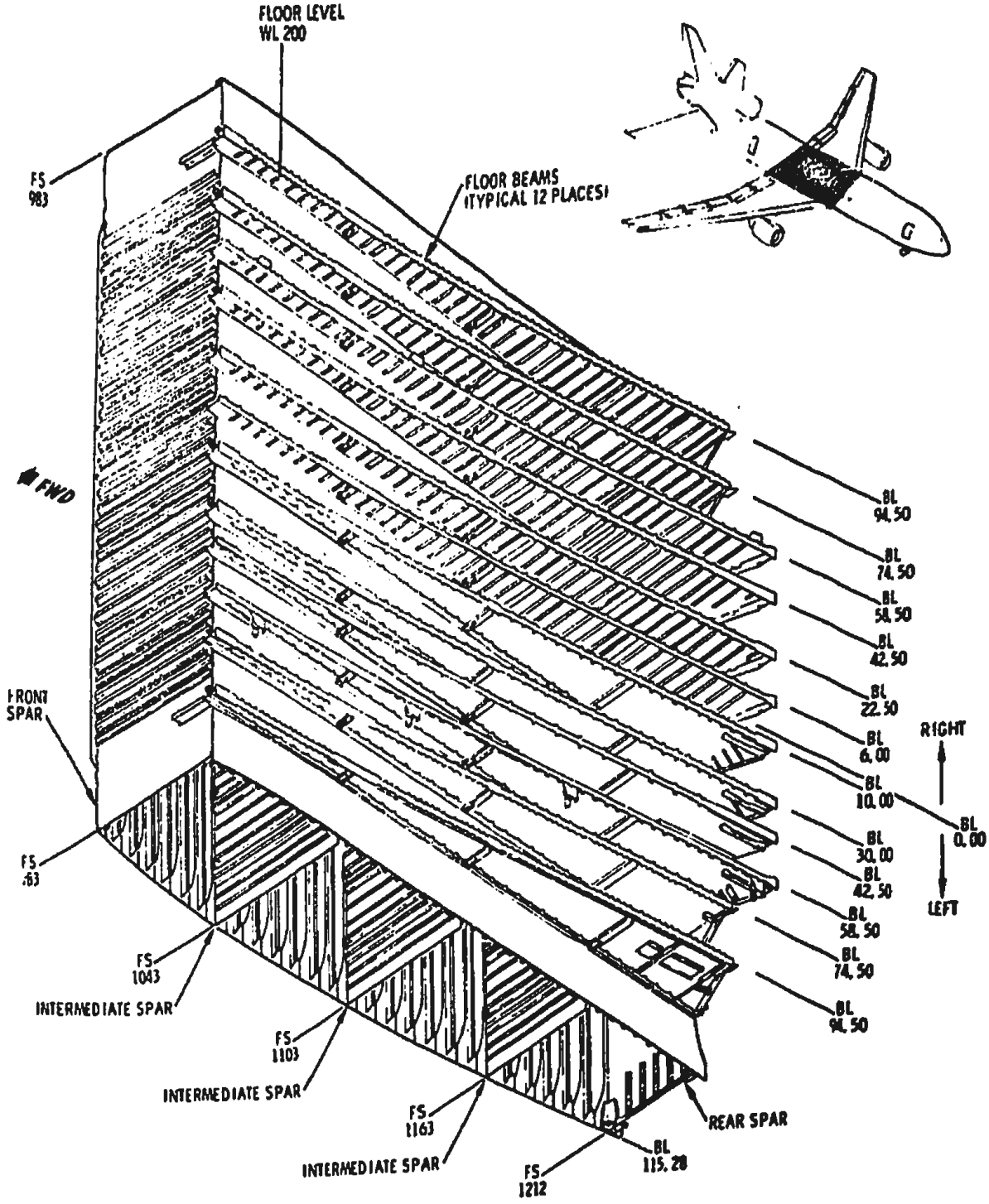
R cabin floor boards and passenger seat tracks. Center wing
R box is part of the mid-section fuselage (Ref. 53-00-00
R Figure 1, and 53-11-00 Figure 1).



Center Wing Box Structure
Figure 3

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EFFECTIVITY: ALL

WING SPARS - DESCRIPTION AND OPERATION

1. General

The wing spars are primary structural components of the wing main frame. The spars extend from one wingtip through the center wing box structure to the opposite wingtip. The spars are shear-resistant beam structures. Fatigue resistance and corrosion protection is provided through saturation shot-peening. Powerplant pylon fittings (Ref. 57-43-00), control hinge supports, actuators, and accessory mounts associated with the flight controls are attached to the spars.

A. Outer Wing Box Spars

The outer wing spars are constructed of vertically stiffened webs with one-piece upper and lower spar caps. The spar webs are machine-tapered from sheet and plate stock. The vertical web stiffeners are machined from aluminum alloy extrusions consisting of angles, channels, Z and T sections.

The upper and lower spar caps are machine-tapered and shot-peened to angular contour. The spars are saturation shot-peened after machining. One-piece machined forgings with channel ribs and a centrally located hole are provided to stiffen the front spars at the slat track penetration points. Structural slat track cover elements are attached and sealed on the inside surface of the slat track stiffener fittings. Fourteen slat track covers are installed on the inner face of each front spar to prevent fuel leakage from the wing fuel tanks at the points where slat tracks penetrate the wing spar. Each cover is constructed of aluminum and is sealed internally to prevent fuel leakage.

All spar components are faying surface sealed during assembly, and the fasteners are installed wet.

B. Center Wing Box Spars

Five aluminum alloy spars are used in the design of the center wing box structure. The front spar with extruded I-section stiffeners on its front face is positioned at FS 983. The rear spar with extruded T-section stiffeners on its aft face is located at FS 1211.93. Three intermediate spars are located at FS 1043, 1103, and 1163. All of the spars are approximately 19 feet long, and vary in depth to accommodate the airfoil contour.

WING BOX RIBS - DESCRIPTION AND OPERATION

1. General

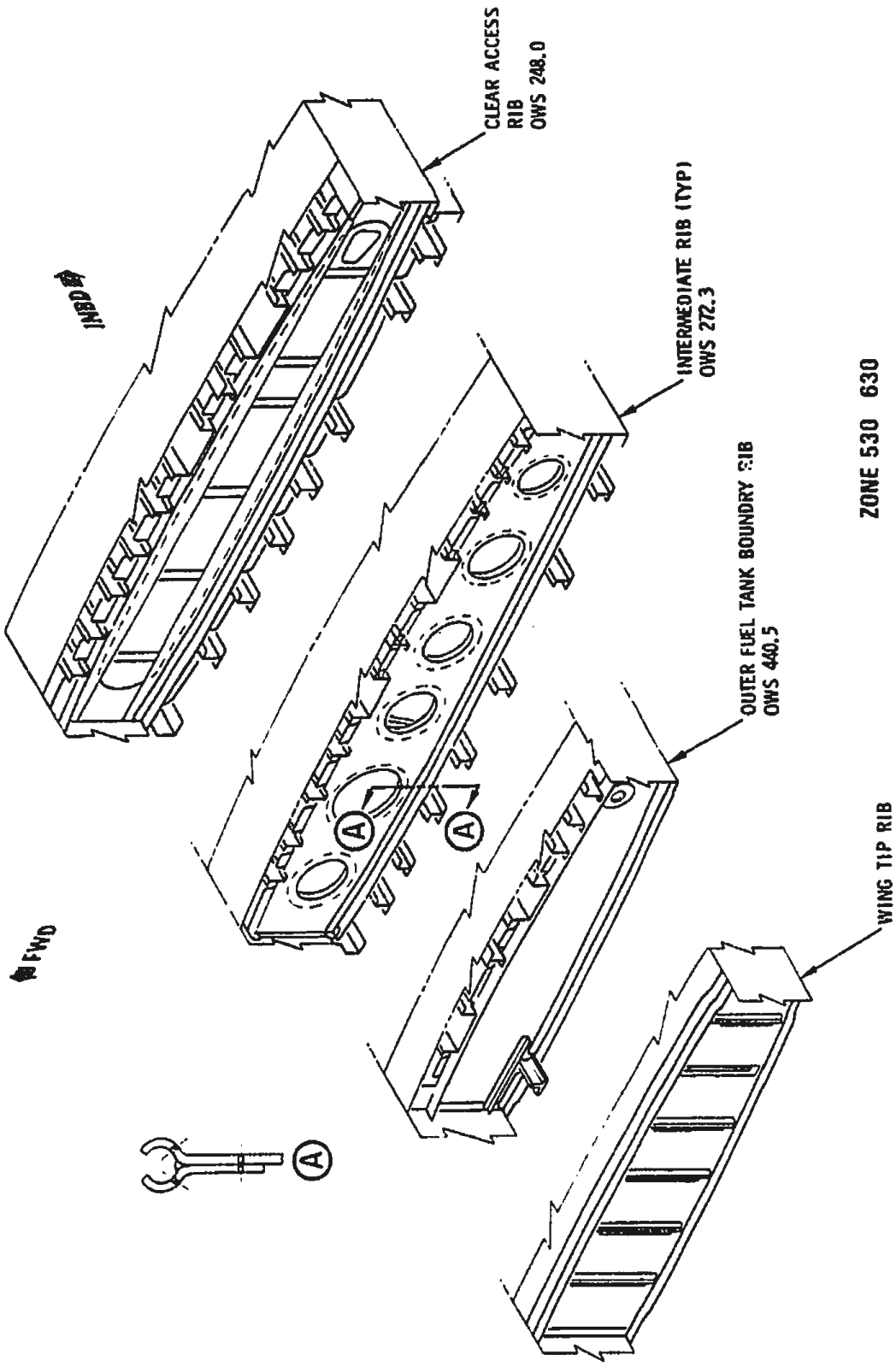
All wing box ribs (Ref. Fig. 1) are positioned perpendicular with respect to the wing rear spar. Wing ribs from WBL 116.5 outboard to WBL 476.0 are positioned at an angle of approximately 25 degrees with respect to the fuselage centerline. From WBL 476 outboard to the wingtip the ribs are positioned at an angle of approximately 30 degrees with respect to the fuselage centerline. All wing ribs are of the web type with deep drawn lightening holes or truss reinforced access openings, and stiffeners made from extrusions or from sheet metal shapes. Some of the outer wing box ribs serve as fuel tank end ribs or tank divider ribs, and other ribs transmit and distribute loads from the landing gear and the flight surfaces into the wing box.

A. Intermediate Ribs

The intermediate rib is the basic rib configuration, which is used in size variations throughout the wing box. Intermediate ribs are of minimum weight construction, using deep-drawn lightening holes and elliptical access holes. Extruded rib caps are attached to the upper and lower edges of the rib web. Extruded angles are joined at the forward and aft ends of each rib for attachment to the forward and aft spars. The ribs are attached to surface stringers with extruded cruciform clips.

B. Fuel Tank Bulkhead Ribs

All fuel tank bulkhead ribs and fuel tank divider bulkhead ribs are of stiffened web construction. Structural clips, sealing cups, and fuel resistant sealant are used to seal around the periphery and around the stringers.



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Wing Ribs - Outer Main Box
Figure 1 (Sheet 1)

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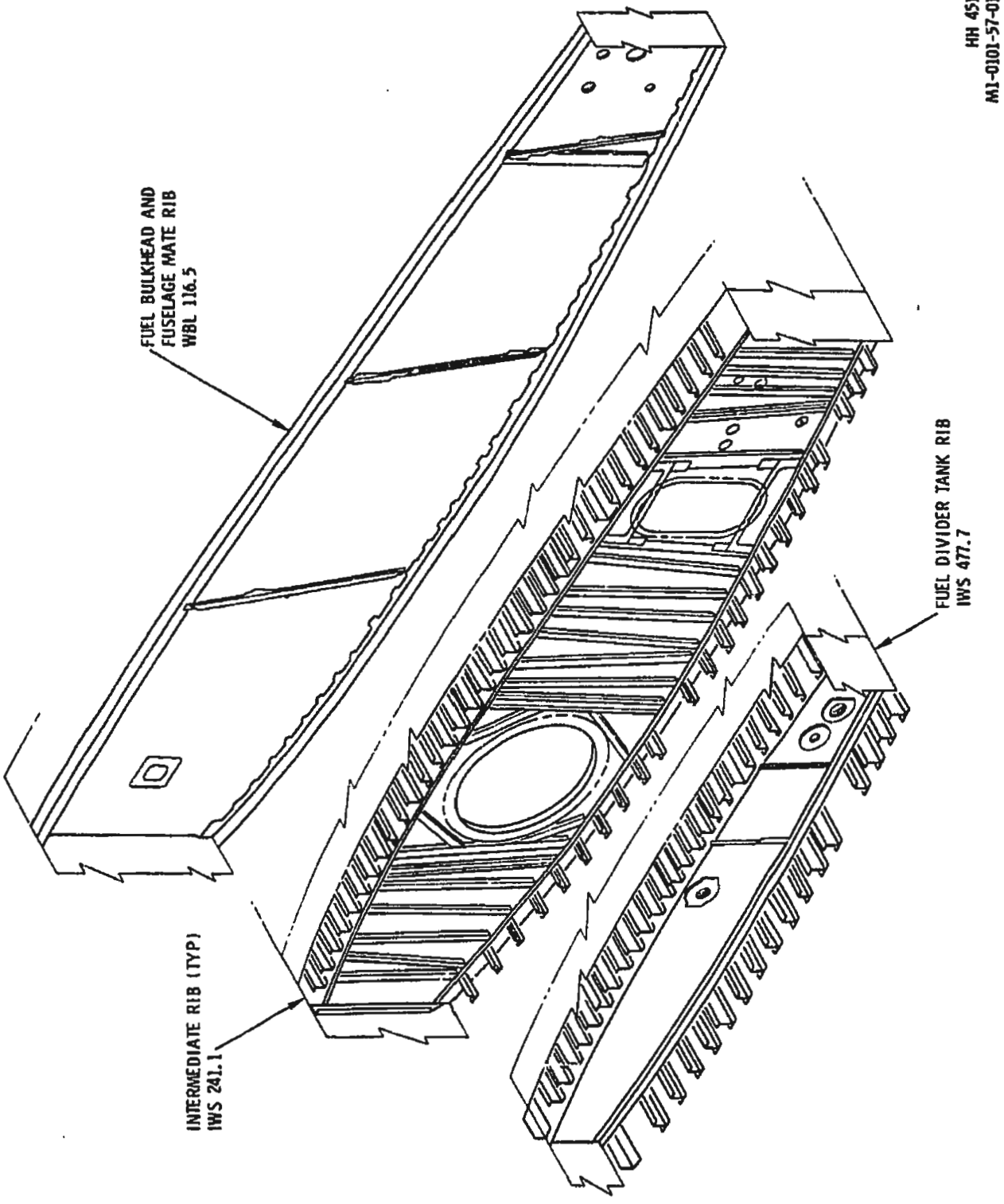


Wing Ribs - Outer Main Box
Figure 1 (Sheet 2)

WING BOX STRINGERS - DESCRIPTION AND OPERATION

1. General

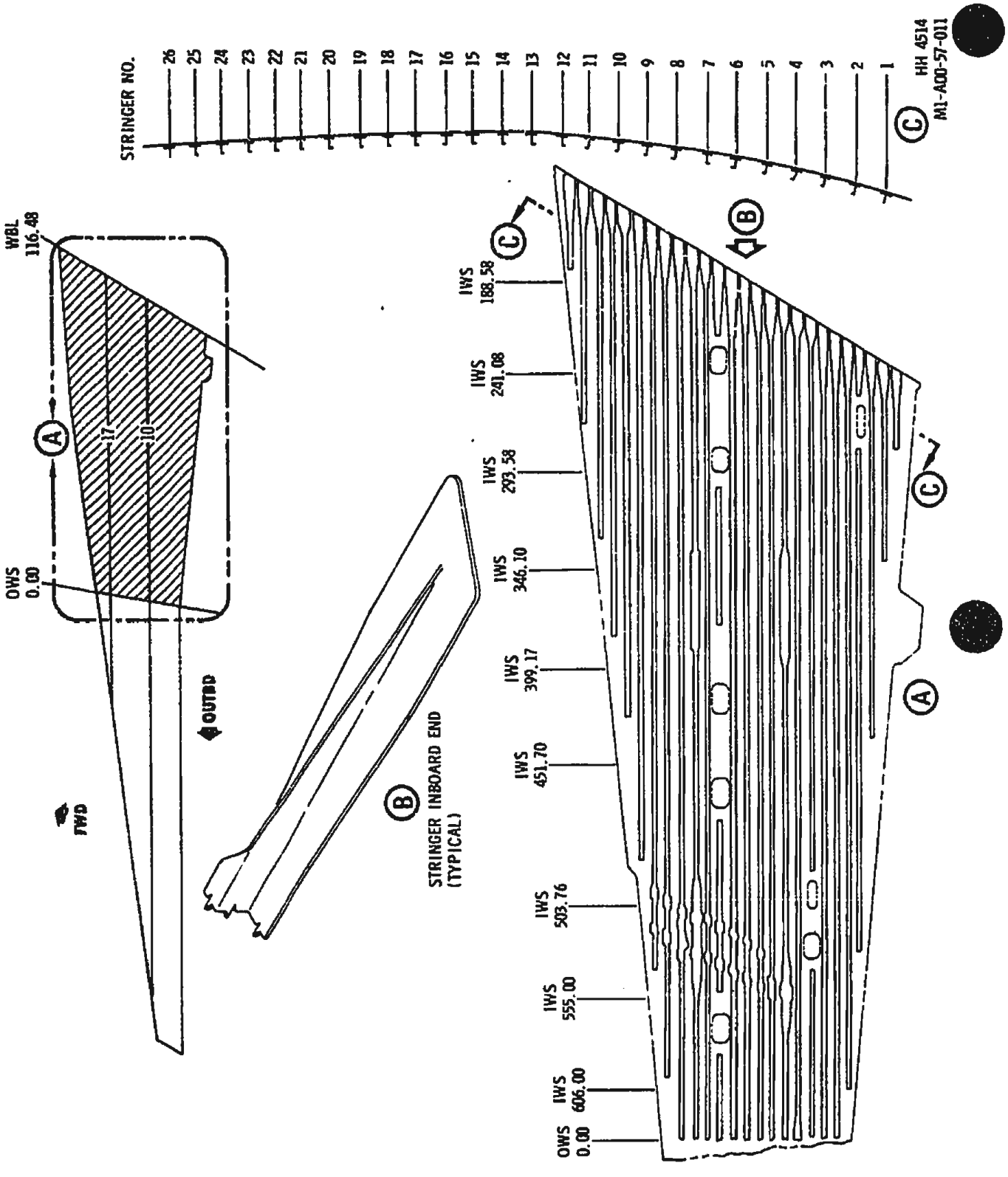
The wing-box stringers reinforce the rise-and-fall, machined-skin panels of the wing boxes. Stringer flanges are also used as splices for the skin panels of the upper and the lower skins of the wing boxes.

The wing box stringers are made from a few basic shapes. Each stringer is machined to different cross sections and thicknesses. All changes in stringer configurations are made gradually with taper in various length and with two-directional taper at the wing-box joints.

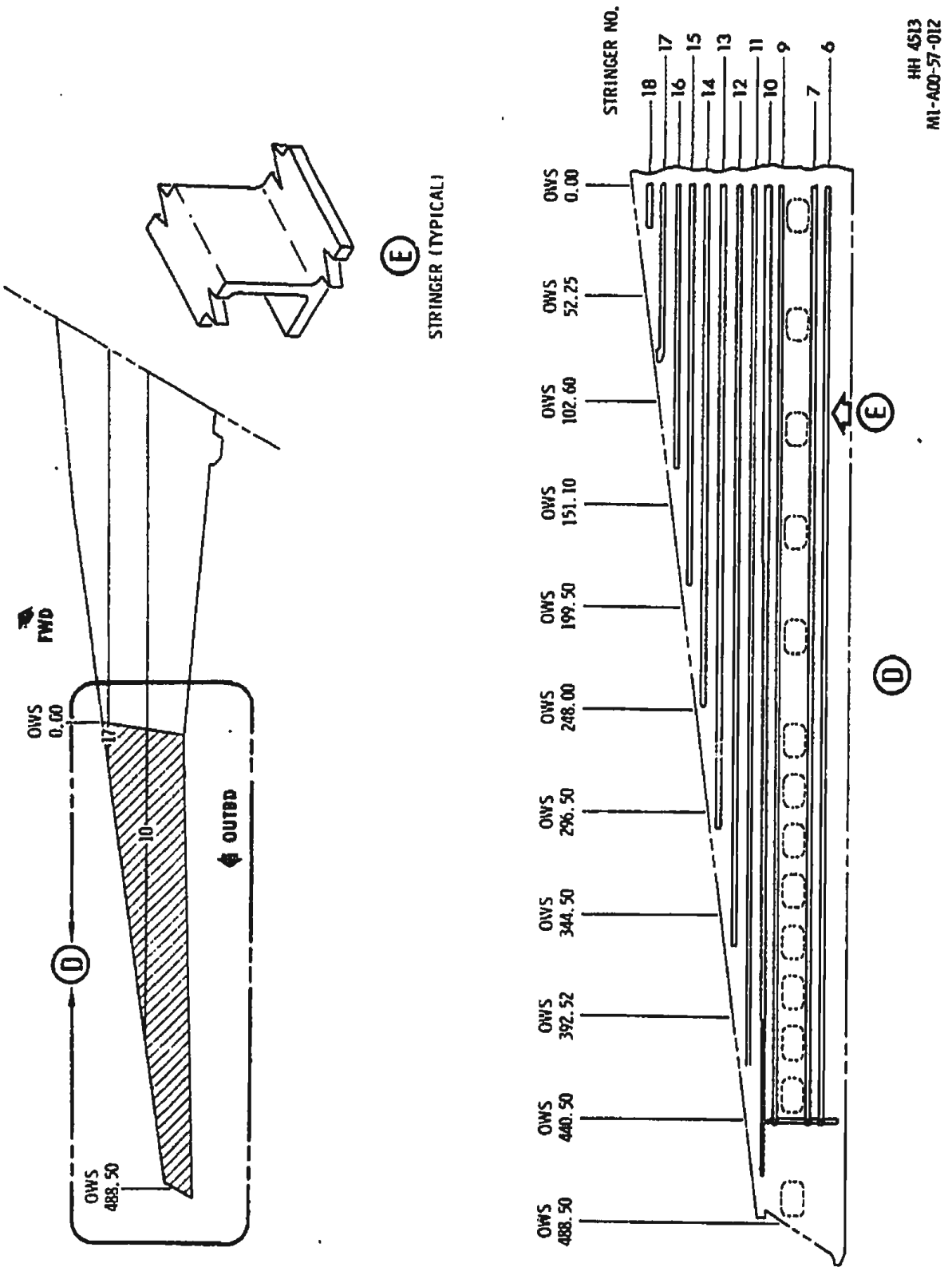
Stringer configurations and surface panel thickness are arranged to meet the design loads, the fail safe requirements and the fatigue requirements. The stringer-skin combination provides a uniform stress distribution to ensure a long operation life for the primary structure wing boxes.

Thirty-seven stringers on the outer wing box upper panels (Ref. Fig. 1) are spaced approximately 5 inches apart. All stringers have a Z-shaped cross section, with the exception of two splice stringers, which have a T-J cross section. Stringers serve also as integral vent manifolds for the fuel tanks. All surface stringers are machined from aluminum extrusions. Stringers are formed to contour by shot-peening or hot-forming methods, and by saturation shot peening.

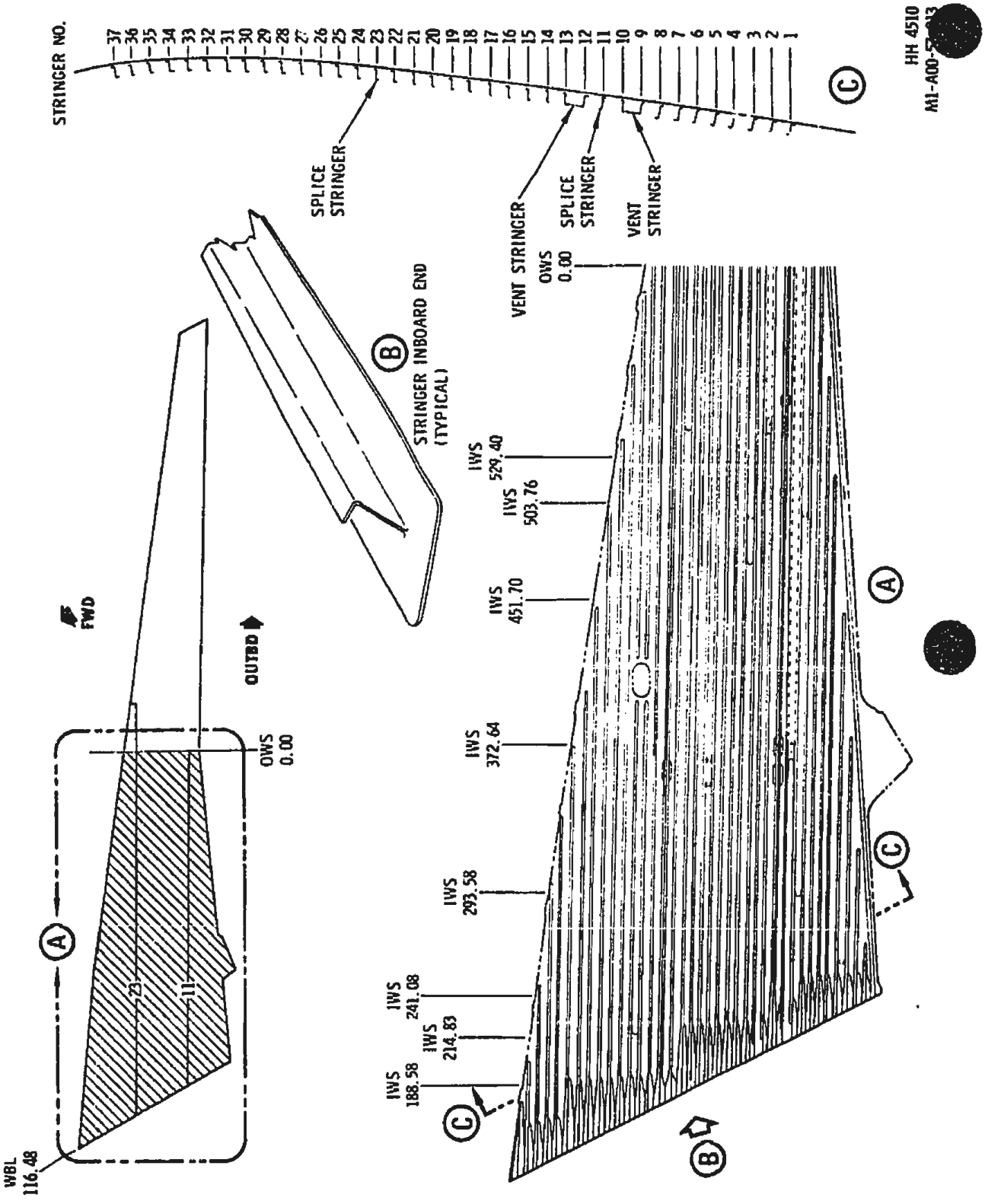
Twenty-six stringers (Ref. Fig. 2) spaced approximately 7.5 inches apart, are used to reinforce the lower wing box skin panels. All stringers have a T-J cross sectional shape and are machined from aluminum alloy extrusions.



Wing Box Stringers Lower Surface
Figure 1 (Sheet 1)



Wing Box Stringers Lower Surface
Figure 1 (Sheet 2)



Wing Box Stringers Upper Surface
Figure 2 (Sheet 1)

Wing Box Stringers Upper Surface
Figure 2 (Sheet 2)

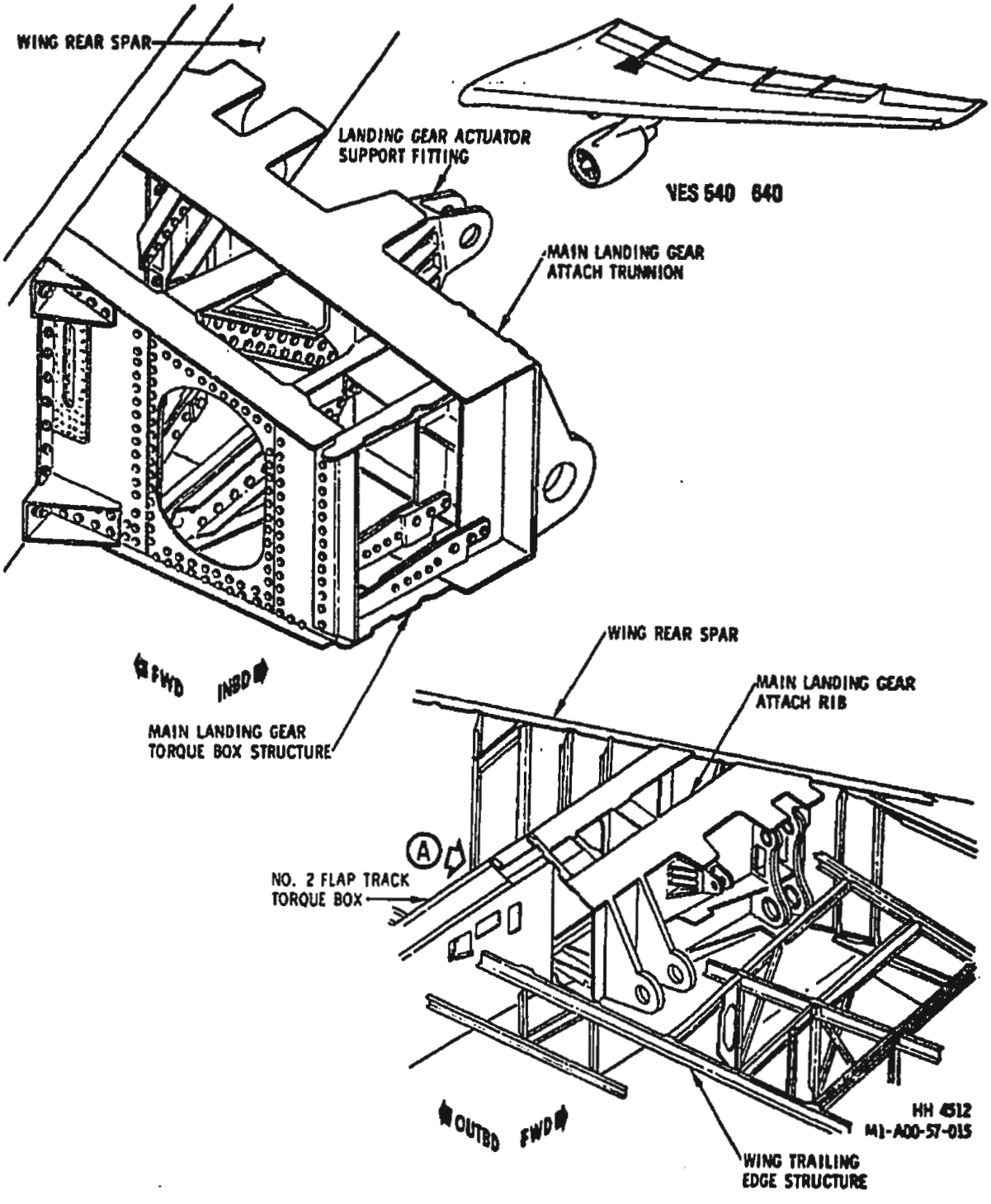
LANDING GEAR SUPPORT STRUCTURE - DESCRIPTION AND OPERATION

1. General

The main landing gear support structure (Ref. Fig. 1) is located at WBL 222.6, and is connected to the heavy outer wing box ribs at IWS 346.1 and 372.6. The structure is designed as a torque box cantilevered from the rear spar. A large steel fitting, located on the inboard face of the torque box provides the primary load path from the landing gear to the outer wing box. The main landing gear support structure is attached to the rear spar and the outer wing box ribs by tension bolts. These tension bolts are torqued to a specified preload. The nuts are located on the rear side of the rear wing spar and the main landing gear torque-box fittings.

The preload can be checked by a torque check on the tension bolt nuts. Access is gained through the wheel well for the inboard set of three nuts and through an access hole in the outboard rib of the main landing gear torque box for the outboard set of the three nuts.

The wing box upper and lower surfaces are extended approximately 15 inches aft of the spars to provide a direct shear attachment of the main landing gear torque-box structure to the outer wing
R box panels.



R Main Landing Gear Support Structure
R Figure 1

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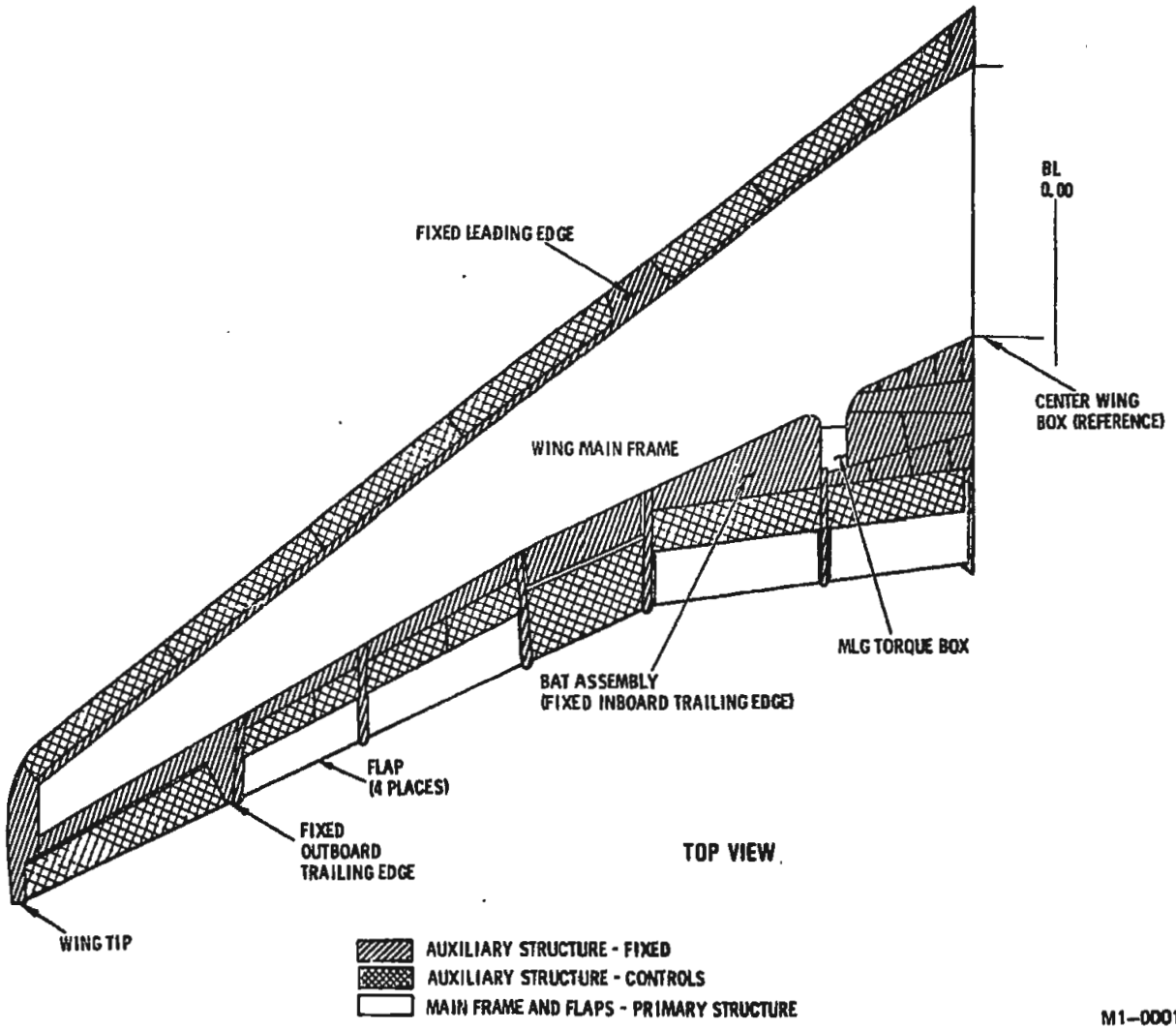
AUXILIARY STRUCTURE - DESCRIPTION AND OPERATION

1. General

R Auxiliary structures (Ref. Fig. 1) are those structural wing
R components not included as primary structures. Primary
R structure includes the wing main frame, the main landing gear
R support structure and flap panels. Auxiliary structures include
R the fixed leading edge, the fixed trailing edge, the wingtip
R structures and the flight control surfaces excluding flap
R panels.



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R Auxiliary Structure
R Figure 1

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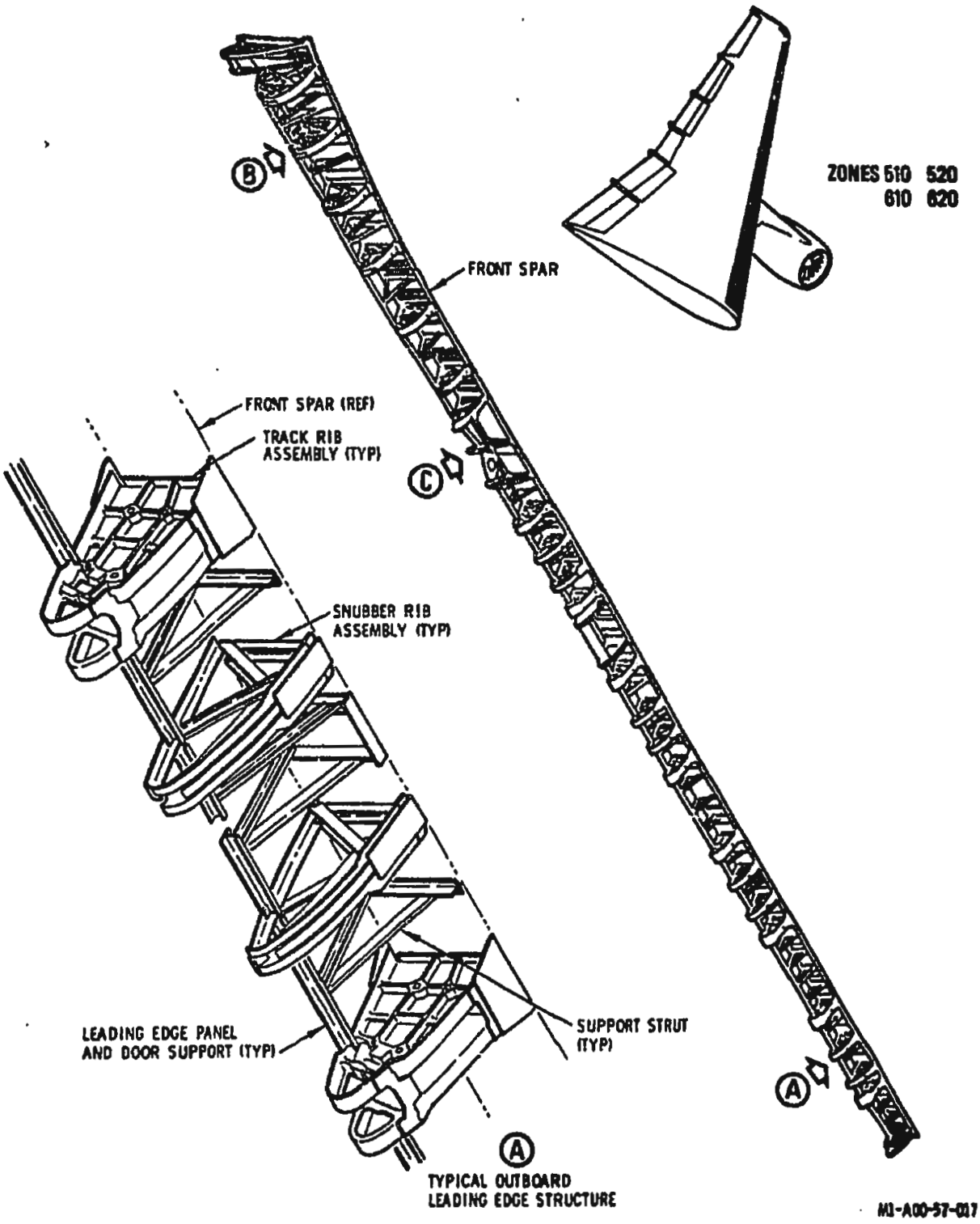
FIXED LEADING EDGE STRUCTURE - DESCRIPTION AND OPERATION

1. General

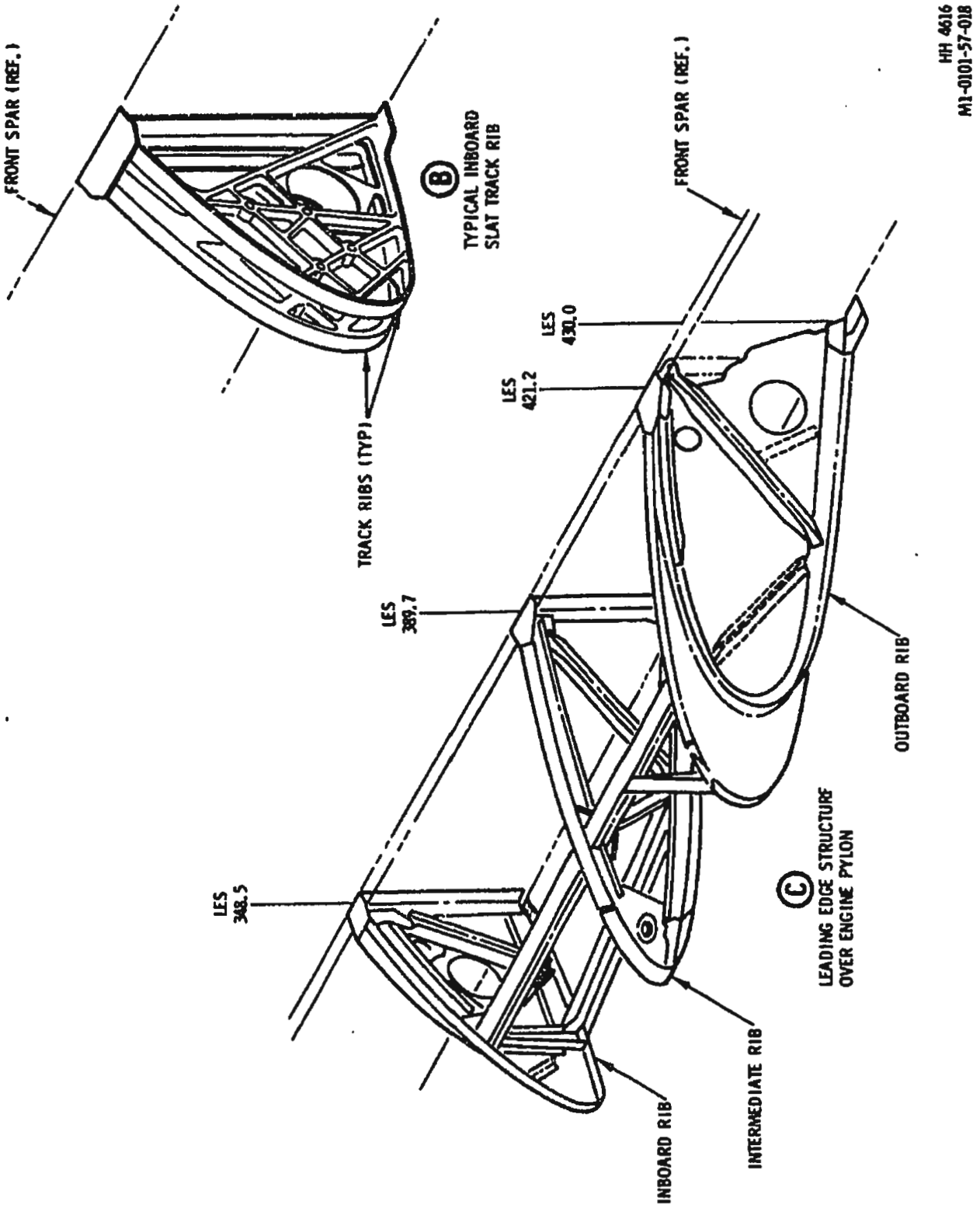
The fixed leading edge of the wing (Ref. Fig. 1) extends approximately 88 feet from the fuselage to the wing tip. The leading edge structure consists of forged-track rib assemblies, intermediate A-frame supports, leading edge skin and access panel support members, truss-type ribs for the pylon fairing and additional snubber ribs for the fixed leading edge structure outboard of the pylon.

R The forged-track rib assemblies and the snubber rib assemblies are part of the slat operating mechanism. They serve also as the supporting structure for the panel support members and the skin panels of the fixed leading edge.



Fixed Leading Edge Structure
Figure 1 (Sheet 1)

EFFECTIVITY: ALL



Fixed Leading Edge Structure
Figure 1 (Sheet 2)

FIXED TRAILING EDGE STRUCTURE - DESCRIPTION AND OPERATION

1. General

The fixed trailing edge structure (Ref. Fig. 1) consists of all wing structure aft of the rear spar (from WBL 117 outboard to the wingtip), except for the landing gear support structure which is part of the wing box. The fixed trailing edge structure supports the inboard and outboard flaps, vanes, spoilers, ailerons, and the fixed and removable panels on the upper and lower surfaces. A cavity in the trailing edge structure accommodates the landing gear strut.

Support for the four double-slotted fowler flaps is provided by torque boxes, which are part of the fixed trailing edge structure. Each flap segment is supported at each end by carriage tracks, which are mounted on the side of torque box ribs, and by a swing link, which is fixed to the aft end of the torque box.

Torque boxes number two and five have tracks and swing-links on both sides. Torque boxes number three, four and six have a track and a swing link on one side only and an aileron on the opposite side. The rib for the inboard track and swing-link for flap number one is attached to the fuselage.

A. Inboard Trailing Edge

This portion of the fixed trailing edge is triangular in shape and extends from the fuselage to the inboard aileron. It is also referred to as the bat wing because of its characteristic shape and location.

Four beams and their associated rib structure provide support for the fixed trailing edge surface panels and the spoiler assemblies.

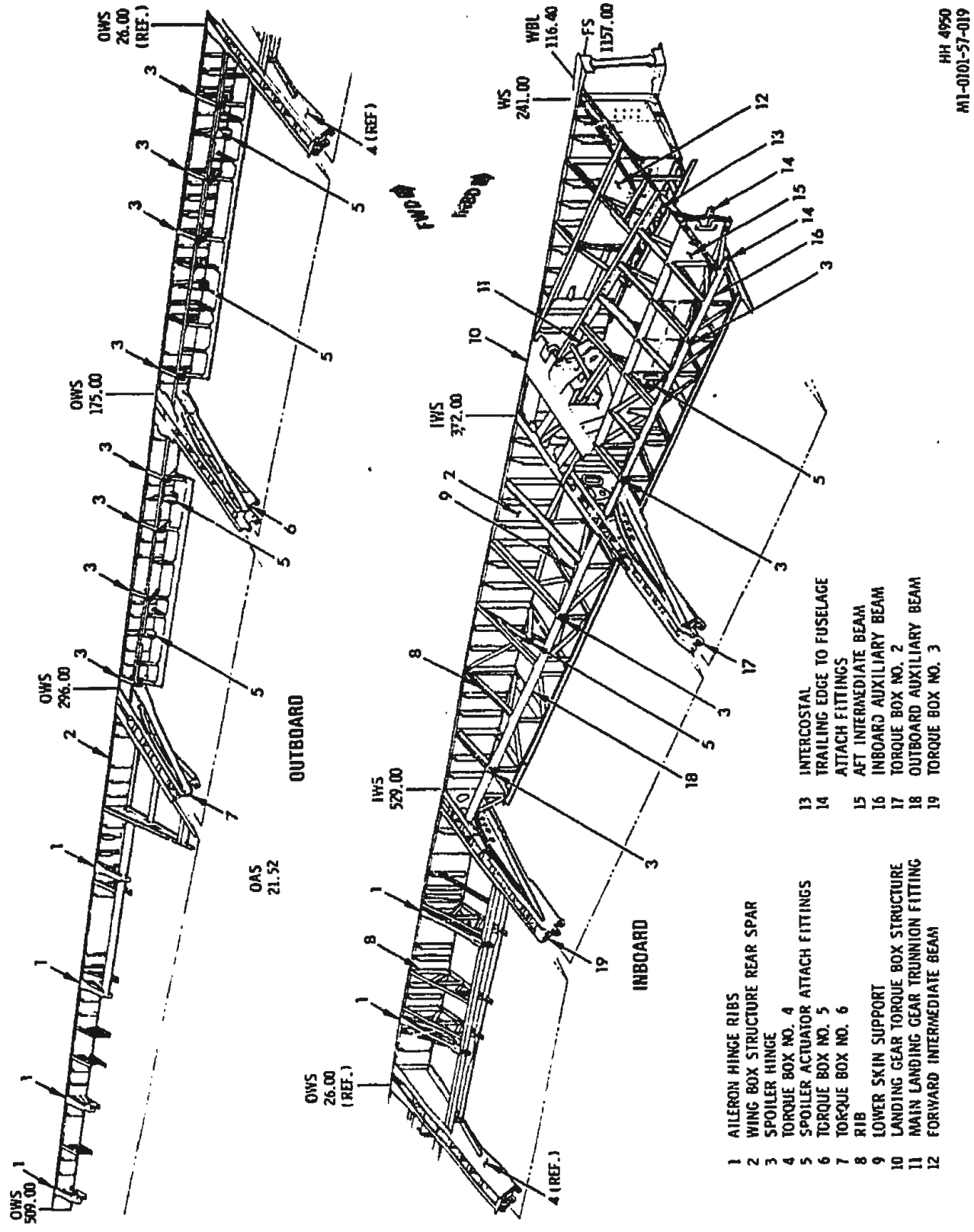
The forward intermediate beam forms the forward side wall of the landing gear well. The aft intermediate beam and the inboard auxiliary beam, with their adjoining rib structure and surface panels, form a box beam which provides support for the inboard spoiler. This box beam is supported at the inboard ends of the beam by fittings mated with corresponding fuselage attachment fittings.

The outboard auxiliary beam provides support for the fixed trailing edge surface panels and for the flap and spoiler support structure.

The four trailing edge beams are simple truss and web members. The ribs are of the built-up truss type. The rib and spar assemblies are fabricated from extrusions, sheet, and machined fittings of aluminum alloy.

B. Outboard Trailing Edge

The outboard fixed trailing edge structure consists of built-up ribs, hinge fittings, and actuator support fittings which are attached to the wing box rear spar. These fittings are machined from aluminum alloy forgings.



Trailing Edge Structure
Figure 1

R

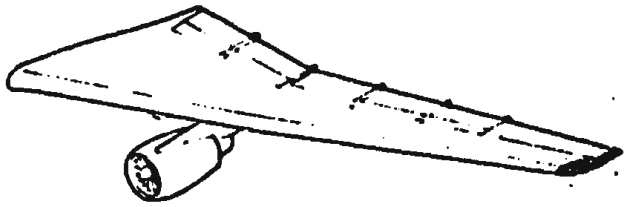
WING TIP - DESCRIPTION AND OPERATION

1. General

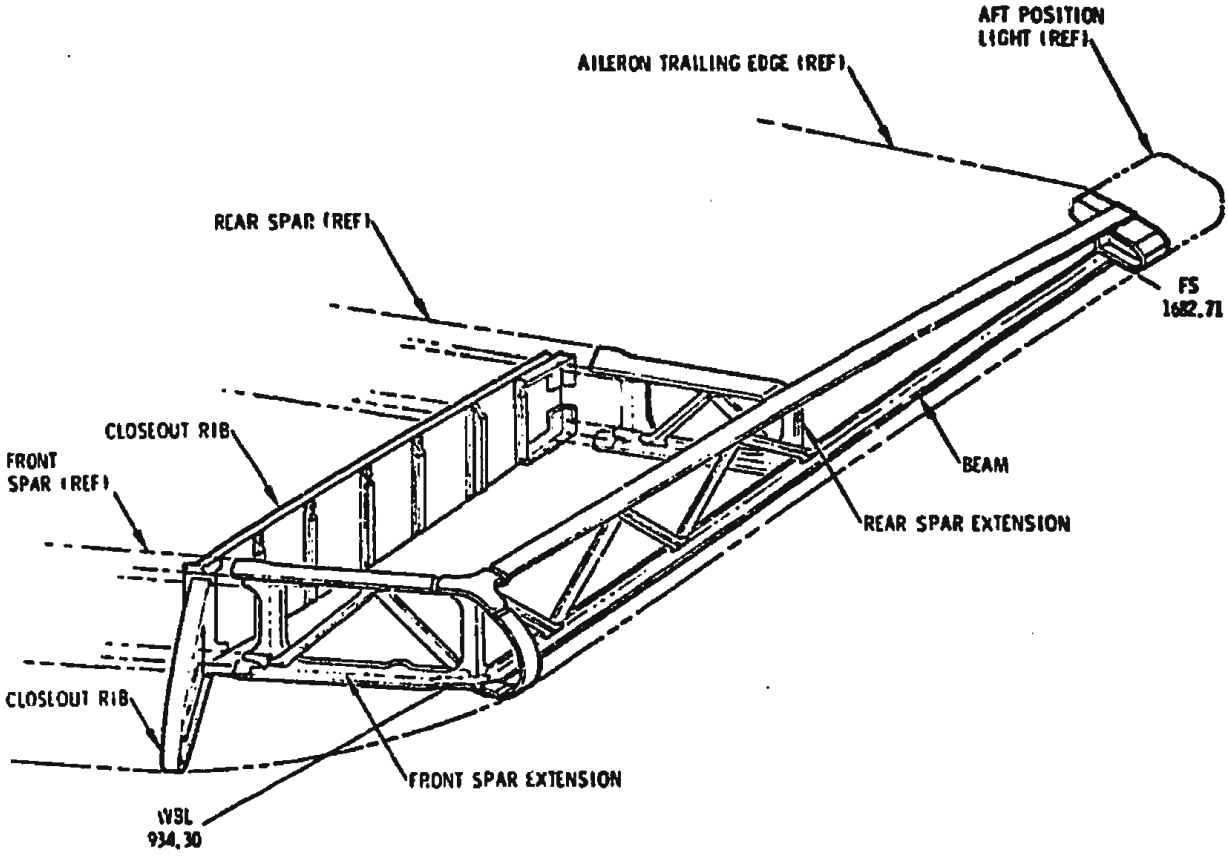
R The wing tip structure (Ref. Fig. 1) consists of the front-spar extension beam, the rear-spar extension beam and the longitudinal beam. All beams are of a truss-type construction.
R They are enclosed and connected to the wing tip skins and panels (Ref. 57-35-00).

R Wing tip position lights are located forward and aft on the assembly.

R The wing tip assembly is removed and installed as a unit. The
R wing tip is attached with bolts to the leading edge closeout
R rib, the outer wing box closeout rib and the front and rear spar
R extensions of the outer wing box.



ZONES 535 635



HH 4371
M1-A00-57-021

R Wing Tip Assembly
R Figure 1

EFFECTIVITY: ALL

0018

WING TIP - REMOVAL AND INSTALLATION

1. Equipment and Materials

General Purpose Universal Sling, B-715, or equivalent

Crane or lifting device for approximately 100-pound capacity

Sealant - PR8501K (Products Research Corp), or equivalent

Spatula, wood or plastic

2. Referenced Procedure

R 20-51-04 Environmental Sealing

3. Removal/Installation

A. Removal

(1) Remove lower main panel from wing tip (Ref. Fig. 401).

(2) Disconnect connectors for strobe and position lights.

(3) Remove three hoist point screws (Ref. Fig. 401), attach sling with removed screws, and take up slack.

(4) Remove screws along the outer wing box closeout rib.

(5) Scrape off aerodynamic sealing compound along wing tip separation line, using wooden or plastic spatula.

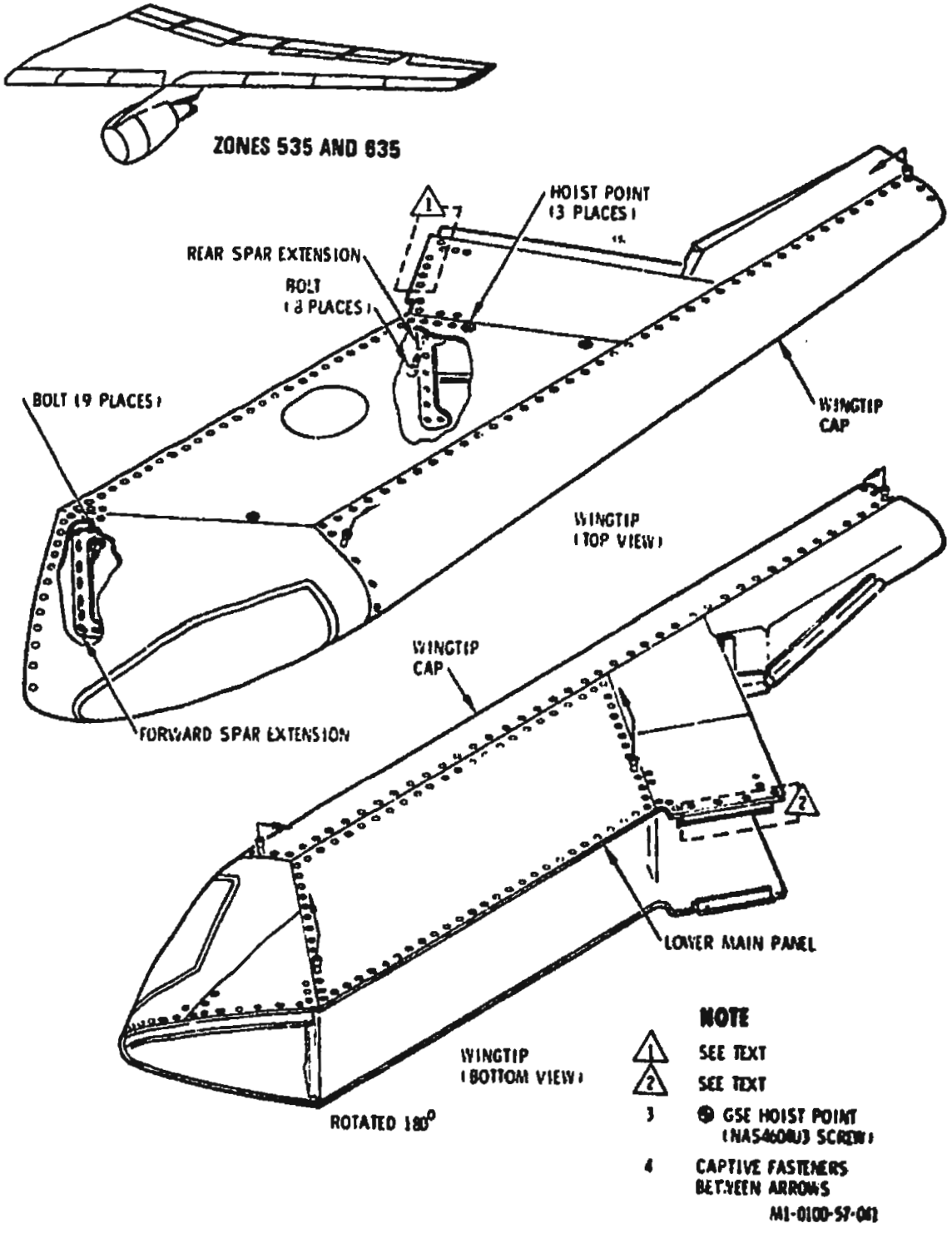
(6) Remove attachment bolts from forward and rear spars.

(7) Remove wing tip with horizontal outboard motion until flux valve is cleared.

(8) Stow wing tip in protected area (as required).

B. Installation

NOTE: If a wing tip other than the one removed is to be installed, it may be necessary to increase the diameter of certain holes in the upper and lower wing tip skin panels. Refer to Figure 401, delta notes 1 and 2 for the location of specific holes (6 on upper panel and 4 on lower panel) which may be increased in



R
R

Wing Tip - Removal and Installation
Figure 401

EFFECTIVITY: ALL

0018

size from 0.193/0.199 (No. 10), to 0.218/0.224 (7/32) inch diameter

(1) Remove sealing compound along wing tip separation line on wing structure with wooden or plastic spatula and clean as required.

(2) Remove lower main panel from replacement wing tip.

(3) Check condition of antichafe material on wing structure mating surfaces with the wing tip.

CAUTION: DO NOT ALLOW WING TIP TO CONTACT FLUX VALVE.

(4) Attach sling to hoist points, and lift wing tip into position.

(5) Install bolts to attach forward and rear spar extensions to outer wing box spars (Ref. Fig. 401).

(6) Install screws to connect wing tip to outer wing box closeout rib, to leading edge panel, and to trailing edge panel.

(7) Remove sling and install hoist point screws.

(8) Connect electrical connectors for strobe and position lights, and verify operation.

(9) Install lower main panel.

NOTE: Captive (reduced shank) type screws will be torqued to same value as noncaptive screws of same size (Ref. 20-51-02, Table X).

(10) Fill external gap between wing skin and wing tip skin with aerodynamic sealing compound (Ref. 20-51-04).

PLATES AND SKINS - DESCRIPTION AND OPERATION

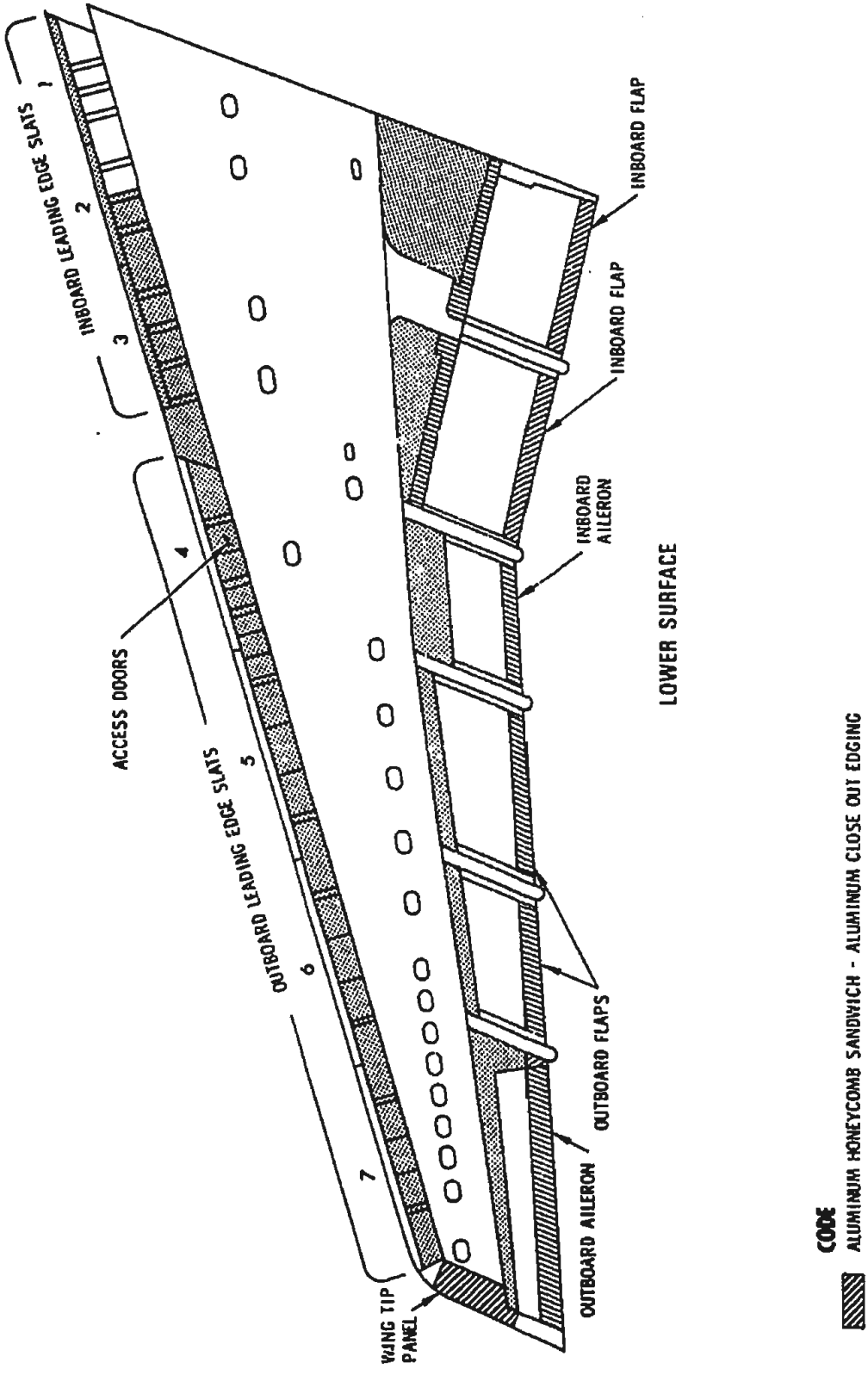
1. General

Plates and skins (Ref. Fig. 1) which cover all of the exterior surfaces of the wing, including the flight control surfaces are made of aluminum alclad sheet, aluminum alclad plate, laminated bonded sheet metal, and aluminum honeycomb core sandwich plates or panels. Die-cast aluminum access doors are also included as wing surface plates.

The skins and plates located on the outer wing box and center wing box structure are highly stressed and are part of the primary structure. The surface-skins of the fixed leading edge, trailing edge, wingtip, and flight controls are classified as part of the secondary structure.

Wing Plates and Skins
Figure 1 (Sheet 1)

EFFECTIVITY: ALL



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Wing Plates and Skins
Figure 1 (Sheet 2)

EFFECTIVITY: ALL

WING FIXED LEADING EDGE SKIN - DESCRIPTION AND OPERATION

1. General

Skin panels (Ref. Fig. 1) of wing fixed leading edge are generally made of aluminum honeycomb sandwich with fiber glass reinforced closeout edging. Skin panels with hinged blowout panels and refueling access panels are of conventional aluminum panel construction.

All panels are attached with screws. Lower panels can easily be opened for inspection and maintenance of system components inside wing fixed leading edge. All lower panels have single-length captive screws and nonstructural suspension hinges for retention of panels to structure in the open position.

Five lower panels between fuselage and engine support pylon have provisions for relief of overpressure from inside wing fixed leading edge (Ref. Fig. 2).

Hinged blowout panels are located between panel stiffeners. They have latches with a controlled holding force. Excessive internal pressure in fixed leading edge, like pressure caused by ruptured engine bleed air duct, would overcome latch holding force and open hinged blowout panels for pressure relief.

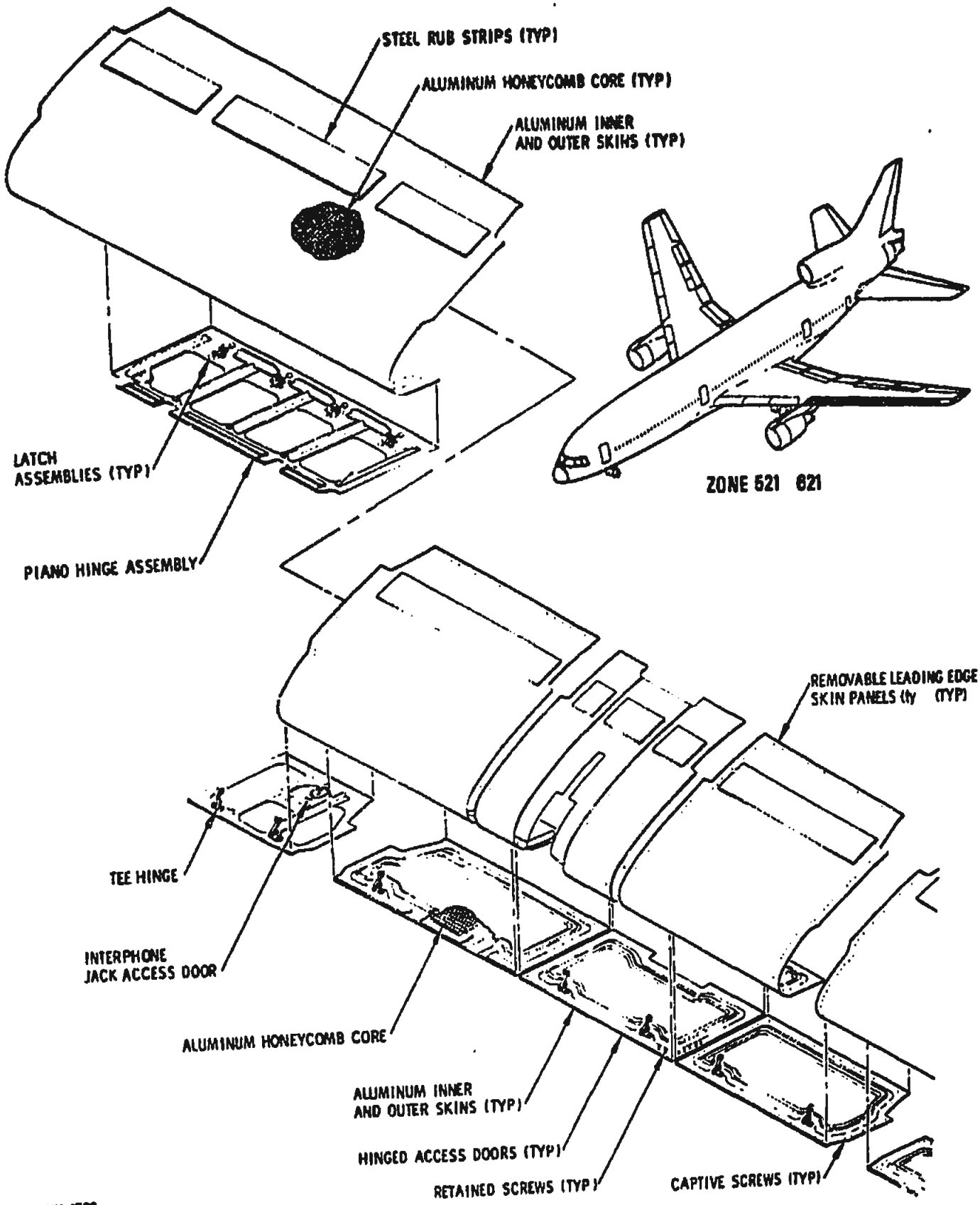
Hinged blowout panels can be closed by manual re-engagement of latch.

Blowout panel latches can be disengaged on the ground, and panels can also be used for inspection and access.

Panel latch is opened by inserting a screw driver into slot of thumb pad and pushing towards wing trailing edge to overpower the latch holding force.

R Latch holding force is used in four steps, ranging between 40
R and 100 pounds.

R Closing of blowout/access panel is done manually by closing hinged blowout/access panel with slotted thumb pad extended and then pushing slotted thumb pad to the flush position for latch engagement.



Wing Fixed Leading Edge Skin Panels and Access Doors
Figure 1

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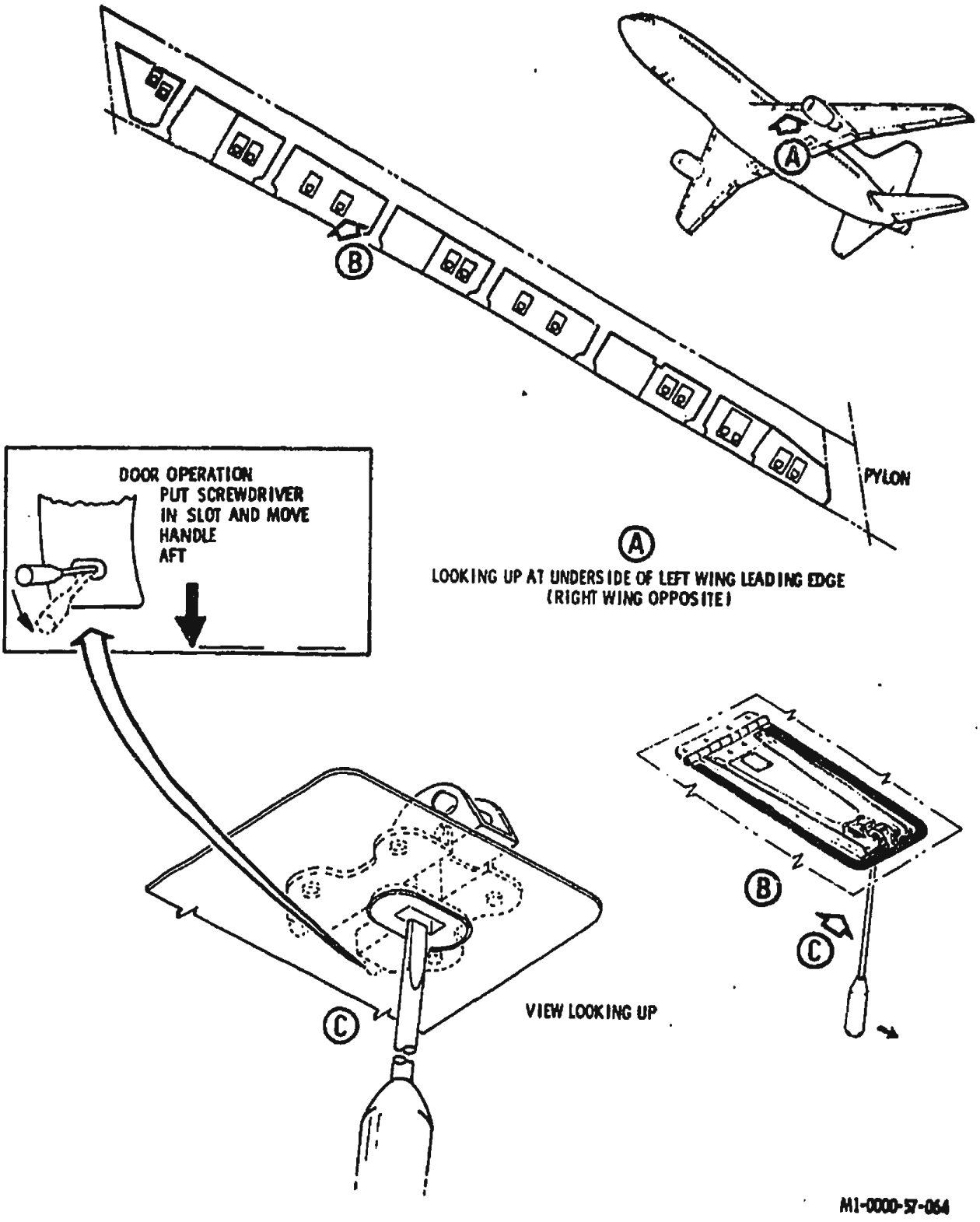
R



R Wing Fixed Leading Edge Blowout Panel
R Figure 2

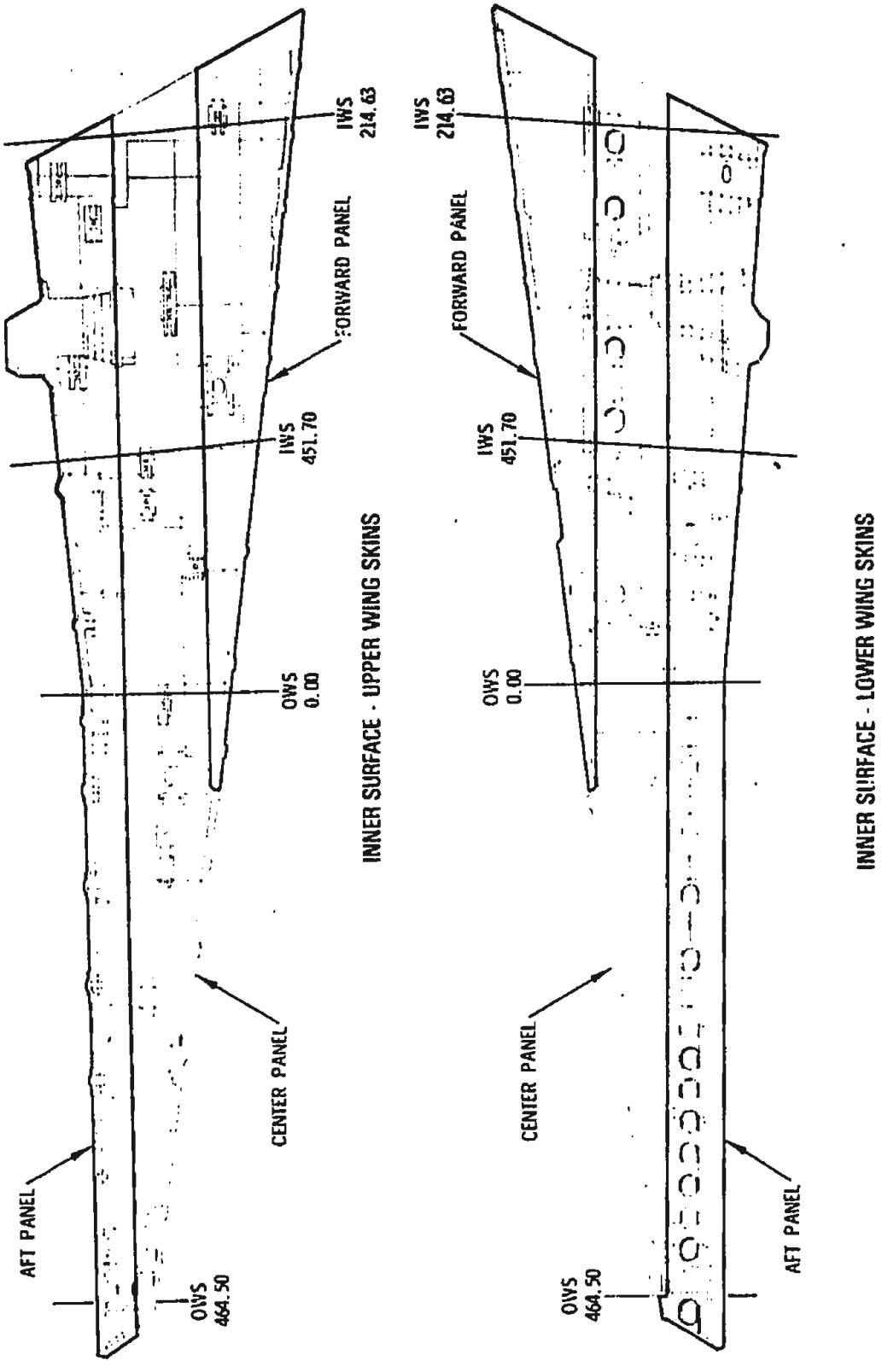
WING BOX SKIN - DESCRIPTION AND OPERATION

1. General

Three outer wing box panels (Ref. Fig. 1 and 2) are joined to form the upper and lower skins of the outer wing box. The individual surface panels are machined from five-eighths-inch-thick hard clad plates on the inner surface, leaving the clad material on the external surface only. Rise and fall machining provides integral reinforced areas on the internal or wet side. The panels are tapered to provide gradual changes in cross section.

The wing box skins are fabricated from 7075-T7651 clad plate, shot-peened to contour, and saturation shot-peened to improve corrosion and fatigue resistance.

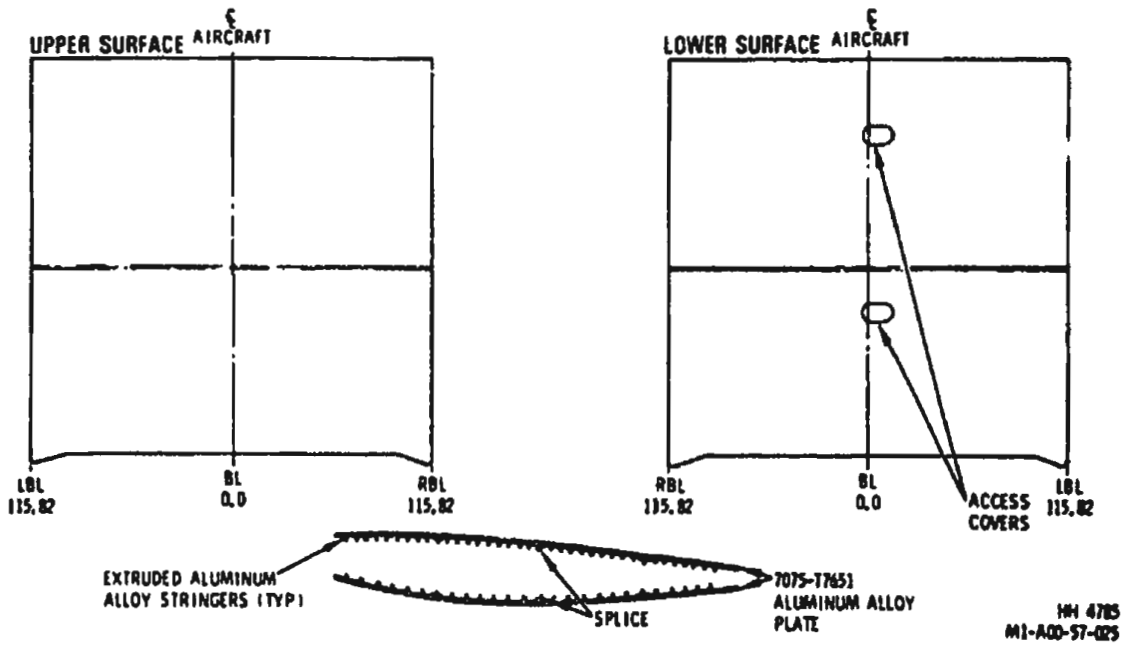
Two skin panels on each surface comprise the cover of the upper and lower surfaces of the center wing box structure. Each skin panel is machine-sculptured from 7075-T7651 aluminum alloy. Skins are also tapered, shot-peened, and finished as described above.



NOTE

THE INNER SURFACE DETAILS REPRESENT AREAS OF DIFFERENT SKIN THICKNESS. THESE SURFACES ARE MACHINE CONTOURED AND TAPERED.

Outer Wing Box Skin
Figure 1



R
R

Center Wing Box Skin
Figure 2

EFFECTIVITY: ALL

001B

ACCESS COVER PLATES AND DOORS - DESCRIPTION AND OPERATION

1. General

Access into the outer wing box structure is through 20 openings on the lower surface that are approximately 11.5 by 16 inches
R (Ref. Fig. 1). The inboard tanks have five openings: four into the fuel tank area proper and one into the surge box area. Large holes through rib webs provide a crawl path for fuel tank maintenance operations. The fifteen openings in the outer wing tank permit maintenance operations in adjacent bays through rib web holes. The doors are of aluminum alloy, pressure die-cast construction, with integral stiffeners and bosses which house the insert nuts.

There are three access openings in the upper surface (Ref. Fig. 2). One opening in each fuel tank provides access to the vent valve and fuel level control switch. The third opening; located near the outboard end of the outboard fuel tank, provides access to the wing fuel vent box installation

A. Lower Surface Access

The lower surface access doors are flanged to rest and to seal against the inner side of the structural wing skin. The access doors are installed with an external clamp ring, and one-quarter-inch-diameter screws of the same length. The access door (534AB/634AB) next to each wing tip has nonmagnetic stainless steel screws because of proximity to the flux valve. All other doors have alloy steel screws.

The attachment screws have a thread length which limits the engagement depth into the encapsulated dome nuts for protection of the dome against damage or penetration. A groove around the edge of each door accepts a molded D-section, Buna-N fuel seal. The seal is cemented into the groove. A phenolic chafing strip, or ring, is bonded outside the seal groove around the edge of the door to prevent fretting of the door on the wing skin seat.

The clamp ring is a flat, one-eighth-inch-thick piece of 7075-T6 aluminum alloy with countersunk holes to accept the retaining screws. Access covers and wing surface panels are finished to provide good electrical continuity.

An aluminum-mesh gasket is installed with the clamp ring. This gasket prevents or reduces fretting and stress-corrosion in clamping ring contact areas with the structural wing skin. The aluminum mesh gasket is treated with anticorrosion grease. In addition the aluminum-mesh

gasket provides electrical conductivity between the door and wing skin for lightning protection.

C NOTE: An expedient airworthy repair, when the aluminum mesh
C gasket has been damaged or otherwise unuseable and no
C parts are available, is to omit the aluminum mesh
C gasket as long as the electrical resistance checks of
C the door to wing skin are performed per MM 20-24-04,
C Table 202, Item 18 (or equivalent resistance check
C included in the respective removal/installation
C instructions) are met. An AMPS item follow up must
C be generated to install the aluminum wire mesh gasket
C within the following two calendar days.

B. Upper Surface Access

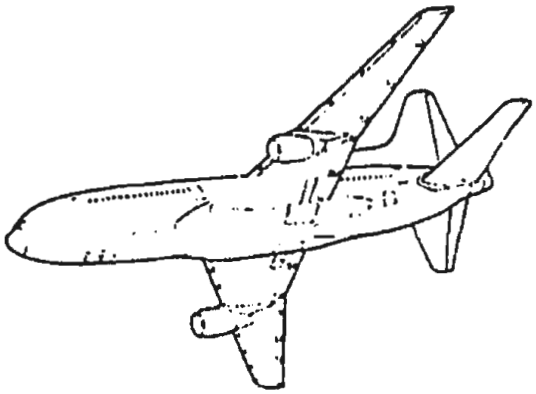
The upper wing surface has three access openings in each wing: one over each tank level control and vent valve, and one over the vent venturi standpipe in the vent box. The access door (534AT/634AT) next to each wing tip has nonmagnetic stainless steel screws because of proximity to the flux valve. All other doors have alloy steel screws. The fuel level control and vent valve openings are 9 by 14 inches, and the vent box access opening is 9.5 inches by 16 inches. All doors are held in place with one-quarter-inch screws.

The upper access doors are mounted on the outside of the wing skin, and the clamp ring is mounted internally. Retainers prevent the clamp ring from falling inward when the door is removed. Two D-section seals and the encapsulated floating insert nuts are located in the clamp ring. Each upper door has two removable screws installed in encapsulated nuts. These screws are used for attachment of a locally fabricated handle to aid in the removal and installation of the door.

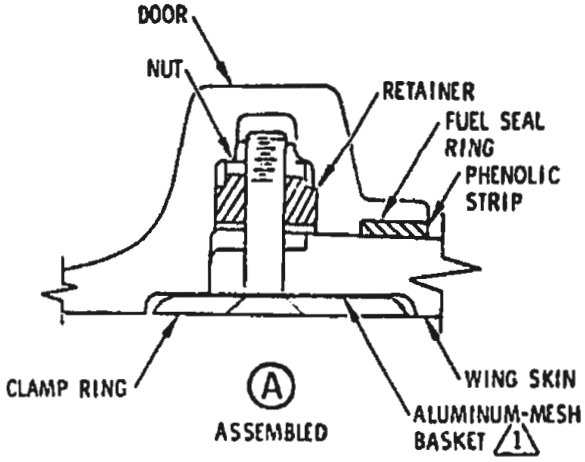
R On aircraft 001-031 without SB57-092,
R an aluminum gasket (unplated, 0.012 inch thick) is installed
R between the wing skin and the door flange at the two
R locations for access to the vent valve and fuel level
R control switch. The aluminum gasket is treated with
R anticorrosion grease. The gasket provides conductivity for
R lightning protection and prevents fretting in the area where
R the access door contacts the wing skin. The aluminum gasket
R is not used for the access door that provide access to the
R wing fuel vent box (Ref. Fig. 402).

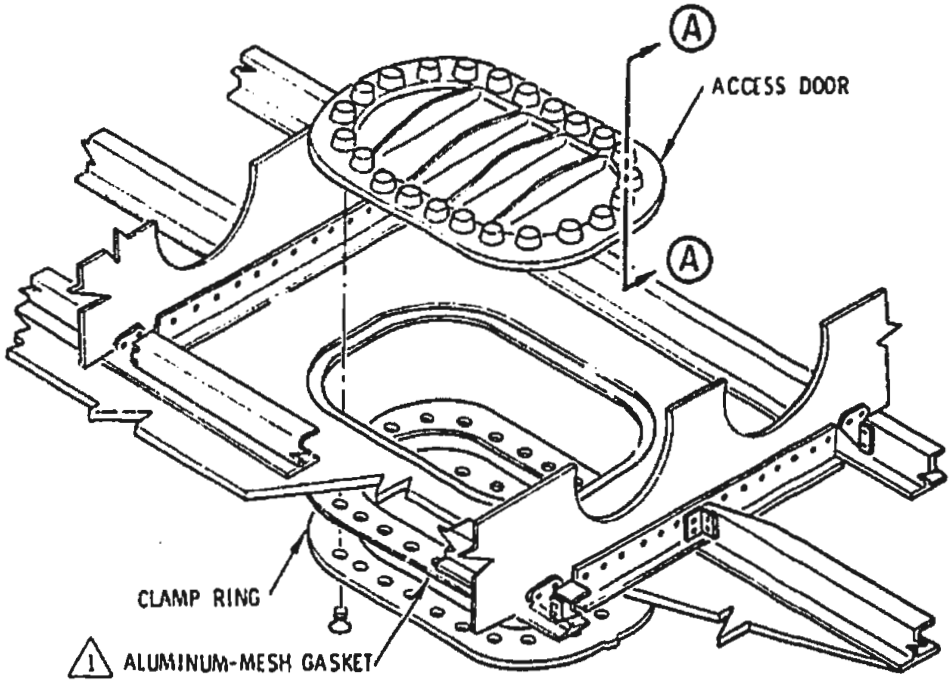
R On aircraft 001-031 with SB57-092 and 032-999,
R an aluminum gasket (unplated, 0.012 inch thick) is bonded to
R the wing skin under the door flange at all three upper wing
R surface locations. The aluminum gasket is treated with

R anticorrosion grease. The gasket provides conductivity for
R lightning protection and prevents fretting in areas where
R the access door contacts the wing skin (Ref. Fig 402).



ZONES 530 630



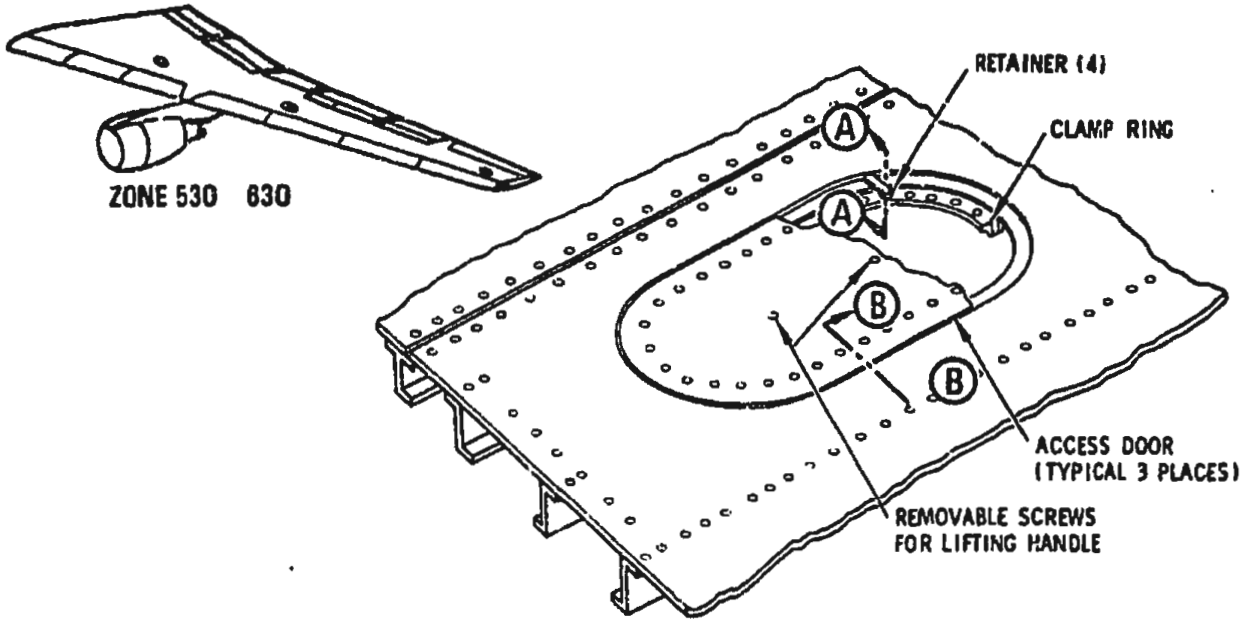


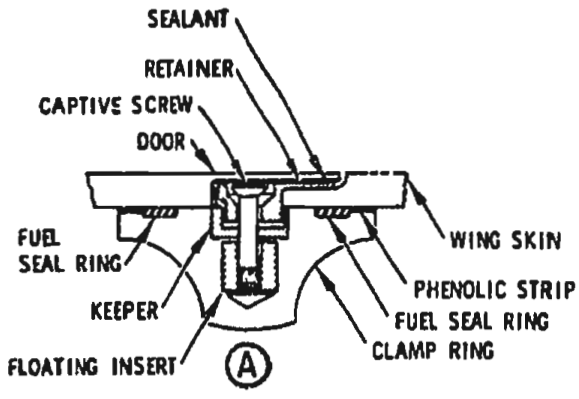
NOTE

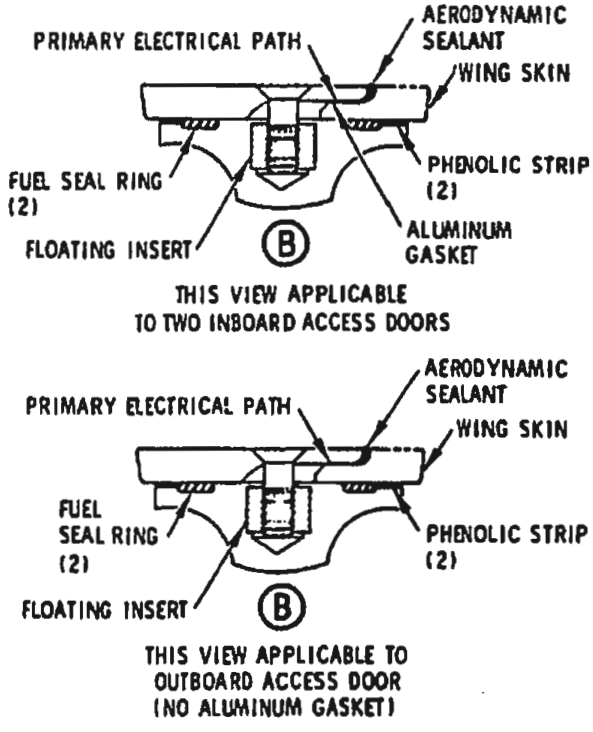
1 AN EXPEDIENT AIRWORTHY REPAIR, WHEN THE ALUMINUM MESH GASKET HAS BEEN DAMAGED OR OTHERWISE UNUSEABLE AND NO PARTS ARE AVAILABLE, IS TO OMIT THE ALUMINUM MESH GASKET AS LONG AS THE ELECTRICAL RESISTANCE CHECKS OF THE DOOR TO WING SKIN ARE PERFORMED PER M/M 20-24-04, TABLE 202, ITEM 18 (OR EQUIVALENT RESISTANCE CHECK INCLUDED IN THE RESPECTIVE REMOVAL/INSTALLATION INSTRUCTIONS) ARE MET. AN AMPS ITEM FOLLOW UP MUST BE GENERATED TO INSTALL THE ALUMINUM WIRE MESH GASKET WITHIN THE FOLLOWING TWO CALENDAR DAYS.

M1-0000-57-071

C C Lower Surface Access Doors
Figure 1







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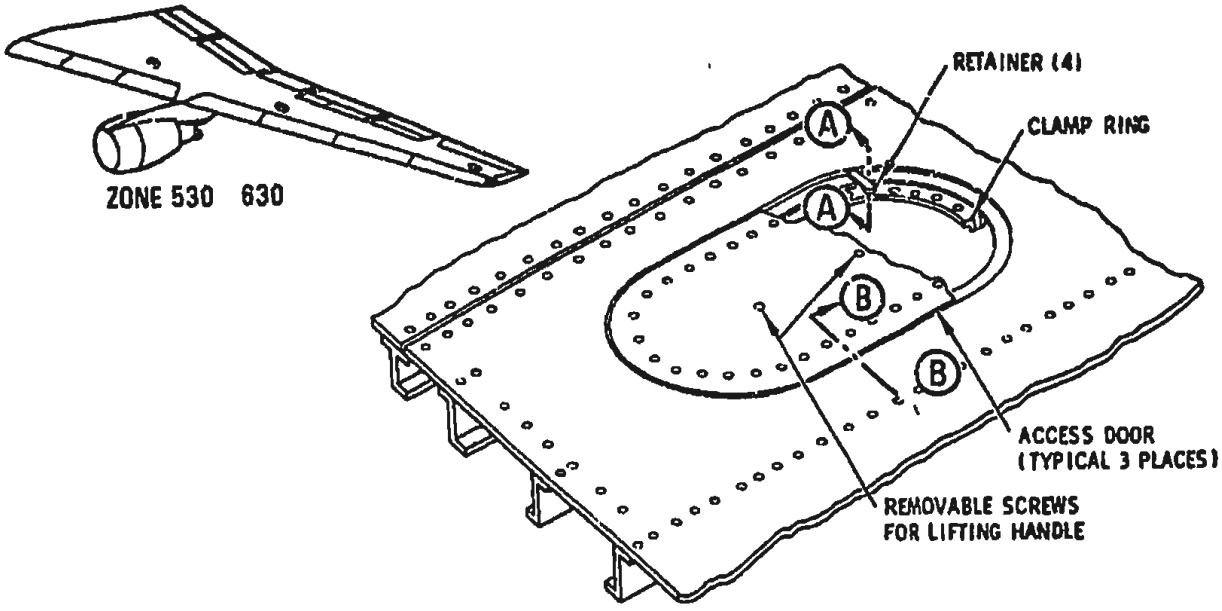
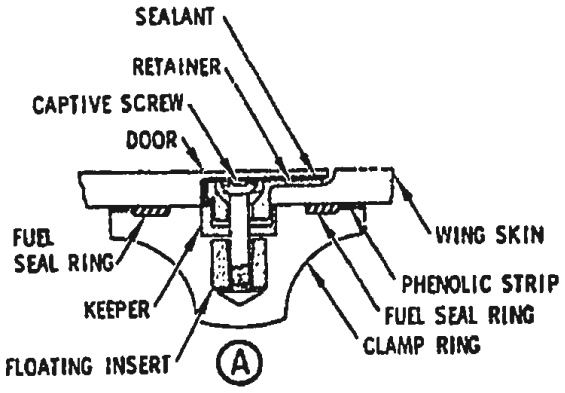
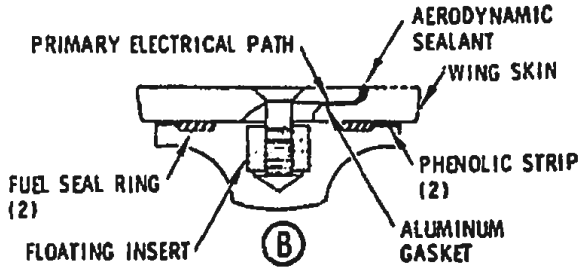
Upper Surface Access Doors
Figure 2







MI-0000-57-073

R Upper Surface Access Doors
R Figure 2

R EFFECTIVITY: 001-031 WITH SB57-092 AND 032-999
R
001B

OUTER WING BOX, LOWER ACCESS DOORS - REMOVAL AND INSTALLATION

1. General

This removal and installation procedure is applicable to all lower access doors of the fuel tanks (Ref. 6-40-00, Fig. 18 and 19).

NOTE: Fuel tanks can be left open and dry for an indefinite period of time with no adverse effect.

2. Equipment and Materials

Anticorrosion Grease, Aeroshell 14 (MIL-G-25537), or equivalent

3. Referenced Procedures

	6-40-00	Exterior Access Doors and Panels
	12-11-00	Fuel Tank Replenishing
	20-24-04	Grounding Connections - LCP 84-1027B
	28-11-00	Fuel Tanks - Maintenance Practices
R	28-11-00	Tanks - Inspection and Check
	28-22-00	Defueling - Servicing

4. Removal/Installation

WARNING: THE FUEL TANKS CONTAIN EXPLOSIVE VAPOR. THEREFORE, OBSERVE ALL APPLICABLE SAFETY REQUIREMENTS AS SPECIFIED IN 28-11-00.

A. Removal

(1) Defuel tank (Ref. 28-22-00).

CAUTION: ACCESS DOORS 534AB AND 634AB ARE ATTACHED WITH NONMAGNETIC STAINLESS STEEL SCREWS. DO NOT MIX STAINLESS STEEL SCREWS WITH ALLOY STEEL SCREWS OF OTHER ACCESS DOORS.

(2) Remove screws and retain for reinstallation (Ref. Fig. 401).

(3) Remove clamp ring and aluminum-mesh gasket. Retain gasket for possible reinstallation.

CR NOTE: An expedient airworthy repair, when the aluminum
CR mesh gasket has been damaged or otherwise
CR unuseable and no parts are available, is to omit
CR the aluminum mesh gasket as long as the
CR electrical resistance checks of the door to wing
CR skin are performed per MM 20-24-04, Table 202,
CR Item 18 (or equivalent resistance check
CR removal/installation instructions) are met. An
CR AMPS item follow up must be generated to install
CR the aluminum wire mesh gasket within the
CR following two calendar days.

(4) Push access door up, tilt and rotate out of access hole

CAUTION: PROTECT FUEL SEAL CONTACT AREA DURING SERVICE OPERATIONS.

(5) Purge fuel tank (Ref. 28-11-00).

(6) Place suitable protective cover over access opening as required.

B. Installation

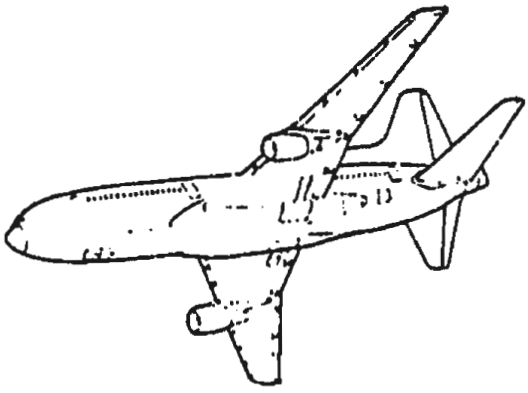
(1) Check door for condition of fasteners, phenolic strips, and fuel seal ring. Check seal contact area on wing skin for cleanness and surface condition.

(2) Prepare for electrical bonding and for lightning protection as follows:

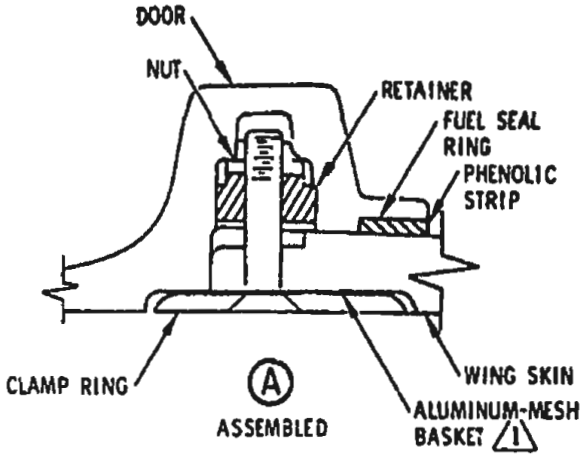
(a) Check and clean faying surfaces of clamp ring, access door, and wing skin which contacts aluminum-mesh gasket.

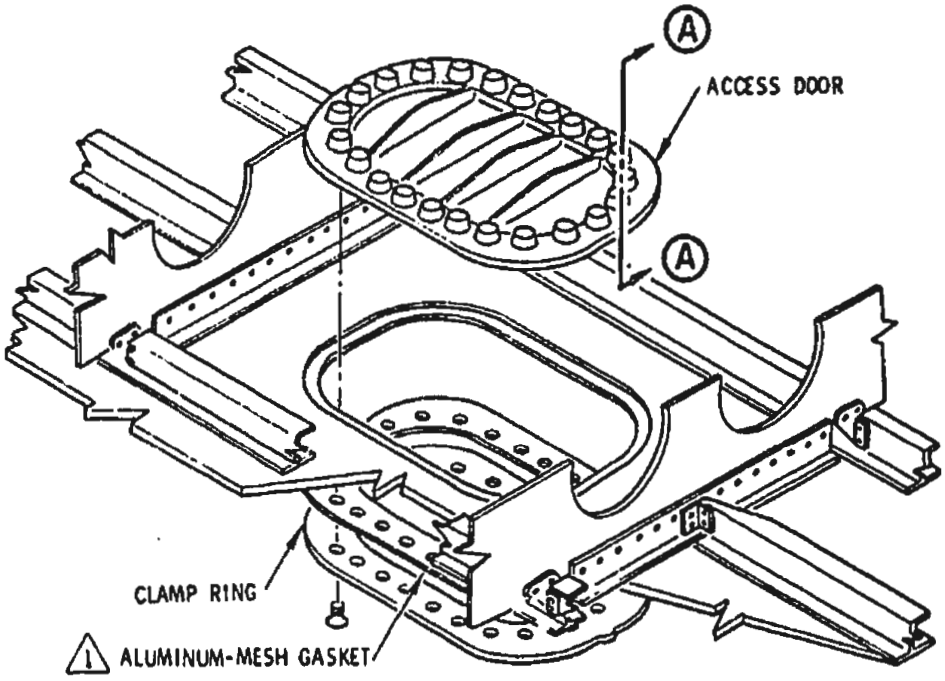
(b) Check aluminum-mesh gasket for mesh resilience and surface conductivity. Clean as required, and
C apply Aeroshell 14 grease. Work sufficient grease into the aluminum mesh so that the gasket will be saturated.

CR NOTE: An expedient airworthy repair, when the
CR aluminum mesh gasket has been damaged or
CR otherwise unuseable and no parts are
CR available, is to omit the aluminum mesh
CR gasket as long as the electrical resistance
CR checks of the door to wing skin are
CR performed per MM 20-24-04, Table 202, Item
CR 18 (or equivalent resistance check included



ZONES 530 630





NOTE

1 AN EXPEDIENT AIRWORTHY REPAIR, WHEN THE ALUMINUM MESH GASKET HAS BEEN DAMAGED OR OTHERWISE UNUSEABLE AND NO PARTS ARE AVAILABLE, IS TO OMIT THE ALUMINUM MESH GASKET AS LONG AS THE ELECTRICAL RESISTANCE CHECKS OF THE DOOR TO WING SKIN ARE PERFORMED PER M/M 20-24-04, TABLE 202, ITEM 18 (OR EQUIVALENT RESISTANCE CHECK INCLUDED IN THE RESPECTIVE REMOVAL/INSTALLATION INSTRUCTIONS) ARE MET. AN AMPS ITEM FOLLOW UP MUST BE GENERATED TO INSTALL THE ALUMINUM WIRE MESH GASKET WITHIN THE FOLLOWING TWO CALENDAR DAYS.

M1-0000-57-071

CR Access Doors - Removal and Installation
CR Figure 401

CR in the respective removal/installation
CR instructions) are met. An AMPS item follow
CR up must be generated to install the
CR aluminum wire mesh gasket within the
CR following two calendar days.

CAUTION: DO NOT APPLY EXCESSIVE ANTICORROSION GREASE. ANTICORROSION GREASE MUST NOT BE SQUEEZED INTO THE TANK AREA WHEN DOOR IS CLAMPED IN POSITION.

C (3) Apply Aeroshell 14 grease to access door directly inside of the molded rubber seal (Ref Fig. 401, View A). Grease on rubber seal is permitted.

(4) Position access door in place and install aluminum mesh gasket and clamp ring.

(5) Torque screws 35 to 45 lb in.

(6) Wipe off excessive grease.

(7) Check electrical resistance of access door to wing skin (Ref. 20-24-04).

NOTE: Electrical resistance for installed access door between door and wingskin must not exceed 0.0025 ohm.

(8) Replenish fuel tank (Ref. 12-11-00) and perform leak check (Ref. 28-11-00).

OUTER WING BOX, UPPER ACCESS DOORS - REMOVAL AND INSTALLATION

1. General

This procedure is applicable to all upper access doors for the fuel tanks (Ref. 6-40-00).

NOTE: Fuel tanks can be left open and dry for an indefinite period of time with no adverse effect

2. Equipment and Materials

Handle for access door removal (handle to be locally fabricated)

R Grease, Aeroshell 14 (MIL-G-25537), or equivalent

R Anticorrosion Compound, MIL-C-16173, Grade 4, or equivalent

R Cleaner, MIL-T-81533, 1-1-1, Trichloroethane, or equivalent

R Sealing Compound, PR 8501-K (Products Research Co., Burbank,
R Calif) or equivalent

R Sealing Compound, LCM40-2188 (Essex Chemical Corp., Compton,
R Calif) or equivalent

R Mold Release Agent, RAM Mold Release No. 225 (RAM Chemicals Co.,
R Gardena, Calif.), or equivalent

R Adhesive, Fed. Spec. MMM-A-1617 (1) Type III, or equivalent

Spatula, wood or plastic

3. Referenced Procedure

R R	6-40-00	Exterior Access Doors and Removable Panels - Description and Operation
	20-24-04	Grounding Connections - LCP 84-1027B
	28-11-00	Fuel Tanks - Maintenance Practices

4. Removal/Installation

WARNING: THE FUEL TANKS CONTAIN EXPLOSIVE VAPOR. THEREFORE, OBSERVE ALL APPLICABLE SAFETY REQUIREMENTS AS SPECIFIED IN 28-11-00.

A. Removal

(1) Remove sealant from gap around access door. Use wood or plastic spatula.

CAUTION: ACCESS DOORS 534AT AND 634AT ARE ATTACHED WITH NONMAGNETIC STAINLESS STEEL SCREWS. DO NOT MIX STAINLESS STEEL SCREWS WITH ALLOY STEEL SCREWS OF OTHER ACCESS DOORS.

(2) Remove two screws in central area of door and install locally fabricated door handle.

(3) Remove all screws from periphery of door and retain for reinstallation.

(4) Remove access door.

(5) If clamp ring is to be removed, proceed as follows:

(a) Remove sealant from around clamp ring retainers and screws (4 places)

(b) Loosen captive screws on clamp ring, rotate retainers, and carefully lower clamp ring. Rotate clamp ring and remove from access hole. (Ref. Fig. 401).

(c) On aircraft 001-031 without SB57-092, remove aluminum gasket for either of two inboard access doors 531AT/631AT or 532AT/632AT (Outboard access doors 534AT and 634AT do not require the aluminum gasket.)

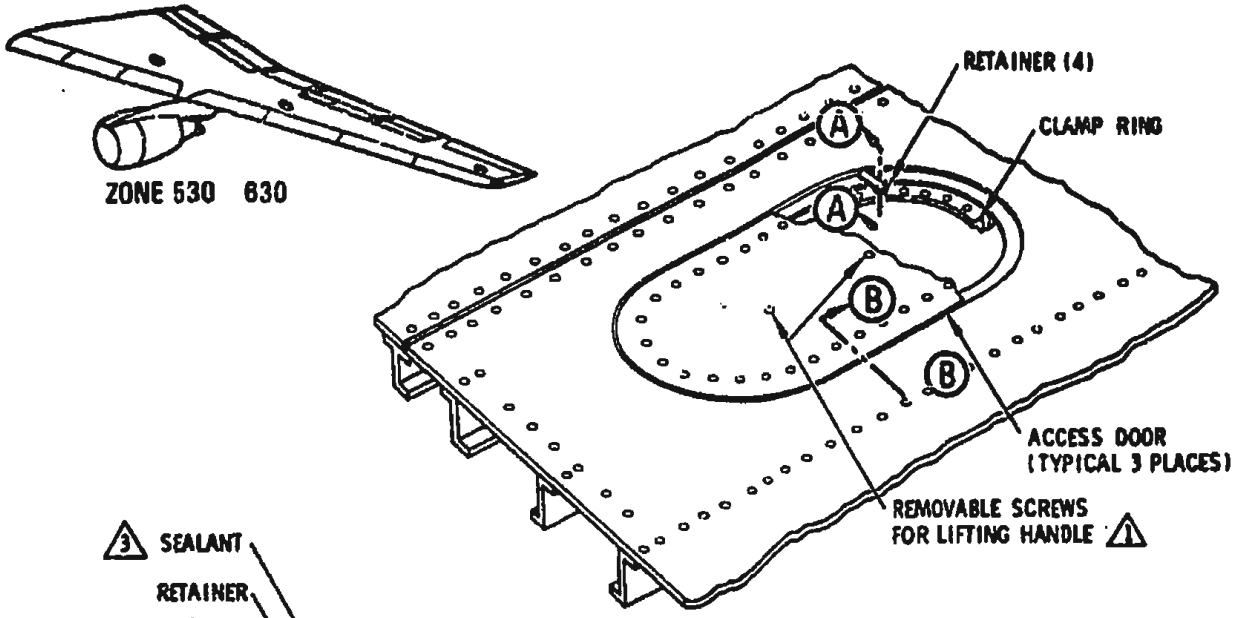
(c) On aircraft 001-031 with SB57-092 and 032-999, aluminum gaskets are bonded to wing skin recesses
R of all three doors and should not be removed
R unless damaged.

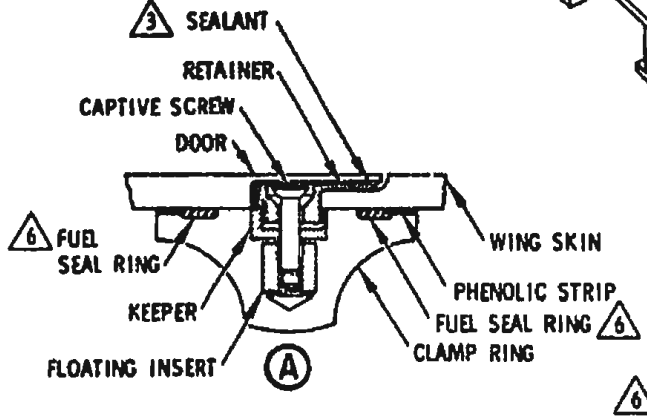
(6) Place suitable protective cover over access opening as required.

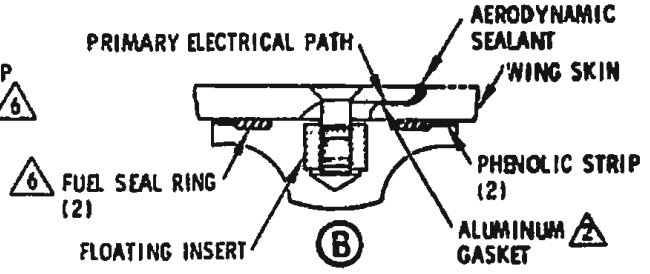
B. Installation

(1) On aircraft 001-031 without SB57-092, clean and check clamp ring, sealed dome nuts, fuel seal rings, screws, phenolic strips, aluminum gasket (at applicable locations), door decals and door and wing skin faying surfaces for condition.

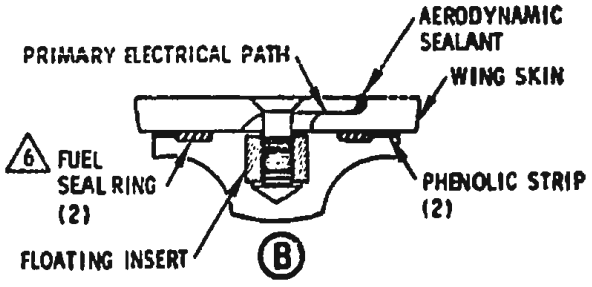
(1) On aircraft 001-031 with SB57-092 and 032-999, clean and check clamp ring, sealed dome nuts, fuel seal







THIS VIEW APPLICABLE TO TWO INBOARD ACCESS DOORS



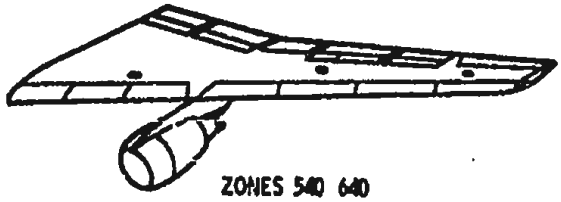
THIS VIEW APPLICABLE TO OUTBOARD ACCESS DOOR (NO ALUMINUM GASKET)

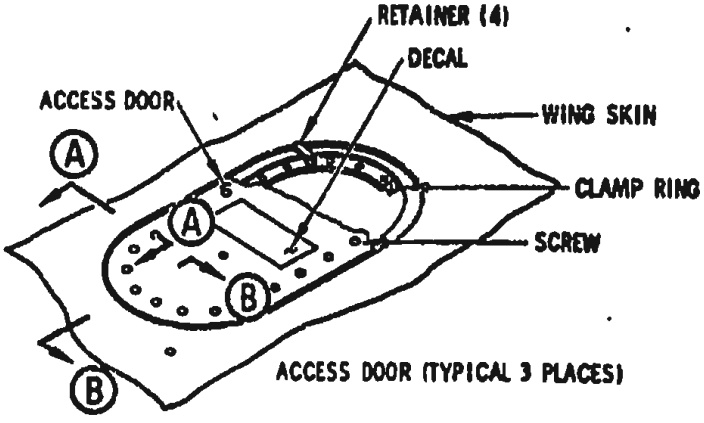
NOTE

1. LOCALLY FABRICATE LIFTING HANDLE
2. UNPLATED ALUMINUM GASKET, 0.012 IN. THICK (2 INBOARD DOORS ONLY). COAT BOTH SIDES OF GASKET WITH ANTICORROSION GREASE, AEROSHELL 14 (MIL-G-25537) OR EQUIVALENT
3. AT EACH CLAMP RING RETAINER (4), APPLY SEALANT TO ENTIRE UPPER SURFACE (INCLUDING HEAD OF SCREW) AND SIDES OF RETAINER (REF. 20-51-04)
4. COAT SEALS, PHENOLIC RINGS AND ALL FAYING SURFACES WITH ANTICORROSION GREASE, AEROSHELL 14 (MIL-G-25537) OR EQUIVALENT
5. ON ACCESS DOOR, APPLY COATING OF MOLD RELEASE AGENT TO FOUR RECESSED AREAS. THESE AREAS ALIGN WITH CLAMP RING RETAINER.
6. COAT FUEL SEAL RING WITH MMM-A-161711 TYPE III ADHESIVE

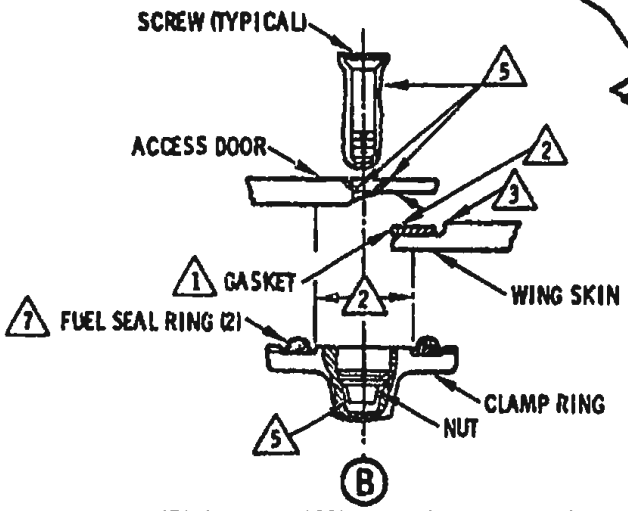
M1-0004-57-028

R Access Doors - Removal and Installation
R Figure 401

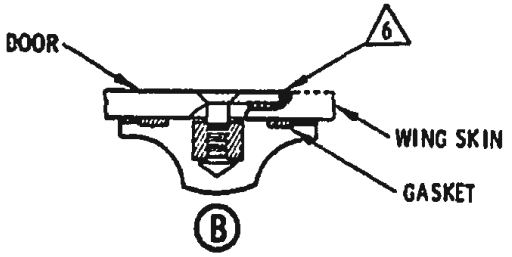




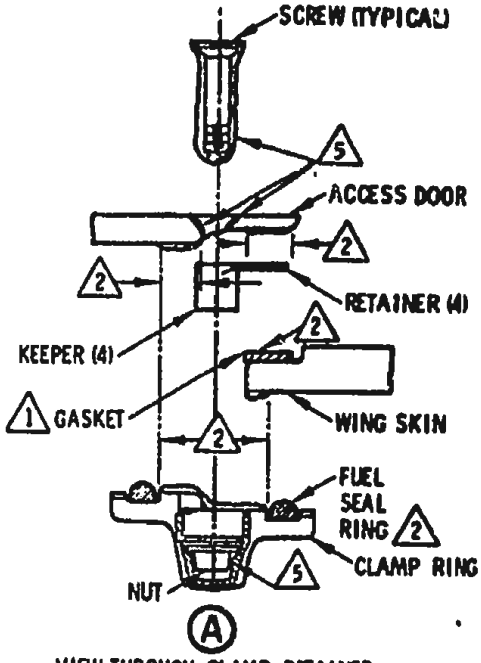
ACCESS DOOR (TYPICAL 3 PLACES)



VIEW SHOWING AREAS REQUIRING LUBRICATION



VIEW OF DOOR INSTALLED (TYPICAL)



VIEW THROUGH CLAMP RETAINER AND LUBRICATION AREAS

NOTE

1. GASKET BONDED TO SKIN RECESSED SURFACE WITH LCM 40-2188
2. APPLY MIL-G-25537 (AERO SHELL 14 PREFERRED) GREASE TO FAYING SURFACES OF DOOR, RING AND GASKETS AS SHOWN
3. THE GROOVE AROUND DOOR AND SKIN PERIPHERY TO REMAIN FREE OF BOTH MIL-G-25537 GREASE AND MIL-C-16173, GRADE 4 CORROSION COMPOUND
4. RING RETAINER TO BE INSTALLED ON TOP OF GASKET, AND MUST NEST INSIDE RECESS IN ACCESS DOOR
5. INSTALL ACCESS DOORS BY USING MIL-C-16173, GRADE 4, ANTICORROSION GREASE ON ALL NUTS IN DOOR RING BY FILLING AND DRAINING CAVITIES, AND ON ALL ATTACH HOLE COUNTERSINKS. WET INSTALL ATTACHING SCREWS ON INSTALLATION
6. AFTER DOOR INSTALLATION, CLEAN GROOVE AROUND DOOR PERIPHERY AND APPLY AERODYNAMIC COMPOUND, PR8501-K
7. COAT FUEL SEAL RING WITH MMM-A-1617(1) TYPE III ADHESIVE

M1-0003-57-042

R Access Doors - Removal and Installation
R Figure 401

rings, screws, phenolic strips, door decal and door and bonded gasket faying surfaces for condition.

(2) Prepare for electrical bonding and lightning protection as follows:

(a) Verify that all faying surfaces are clean.

(b) Verify that clamp ring retainers and captive screws are clean.

(c) On aircraft 001-031 without SB57-092, for either of two inboard access doors (531AT/631AT or 532AT/632AT), verify that aluminum gasket is clean. Apply coat of anticorrosion grease to each side of gasket and install in position in wing skin recess.

(c) On aircraft 001-031 with SB57-092 and 032-999, for three access doors (531AT/631AT, 532AT/632AT or 534AT/634AT), verify that bonded gasket upper surface is clean. Apply coat of anticorrosion grease to upper surface of gasket.

CAUTION: DO NOT APPLY AN EXCESSIVE AMOUNT OF ANTICORROSION COMPOUND.

(3) Using anticorrosion compound, lubricate nuts in clamp ring by filling and draining cavities and coating attach hole countersinks in door (Ref. Fig. 402).

(4) Install fuel seal ring(s) (Ref. Fig. 401) using MMM-A-1617 (1) Type III Adhesive in the groove making certain that the seal ring(s) do not pop out prior to installing the clamp ring.

(5) Apply grease to clamp ring between outer and inner fuel seal ring (Ref. Fig. 401). Grease on fuel seal ring is permitted.

(6) Position clamp ring in tank; engage and tighten captive screws in clamp ring retainers.

(7) At each of four clamp ring retainers, apply sealant to entire upper surface (including head of captive screw) and sides of retainer (Ref. 20-51-04).

NOTE: Apply sufficient sealant on top surface of retainers to fill matching recessed areas in door. Access door is installed while sealant is wet.

(8) On access door, apply coating of mold release agent to four recessed areas. These recessed areas align with clamping ring retainers.

(9) On aircraft 001-031 without SB57-092, Install access door, and torque screws 35 to 45 lb in.

(9) On aircraft 001-031 with SB57-092 and 032-999, install access door; completely coat screws (except exterior flat surface of head) with anticorrosion compound. Torque screws to 20 to 25 lb in. per placard instructions.

(10) Check electrical resistance of access door to wingskin (Ref. 20-24-04).

NOTE: Electrical resistance for installed access door between door and wing must not exceed 0.0025 ohm.

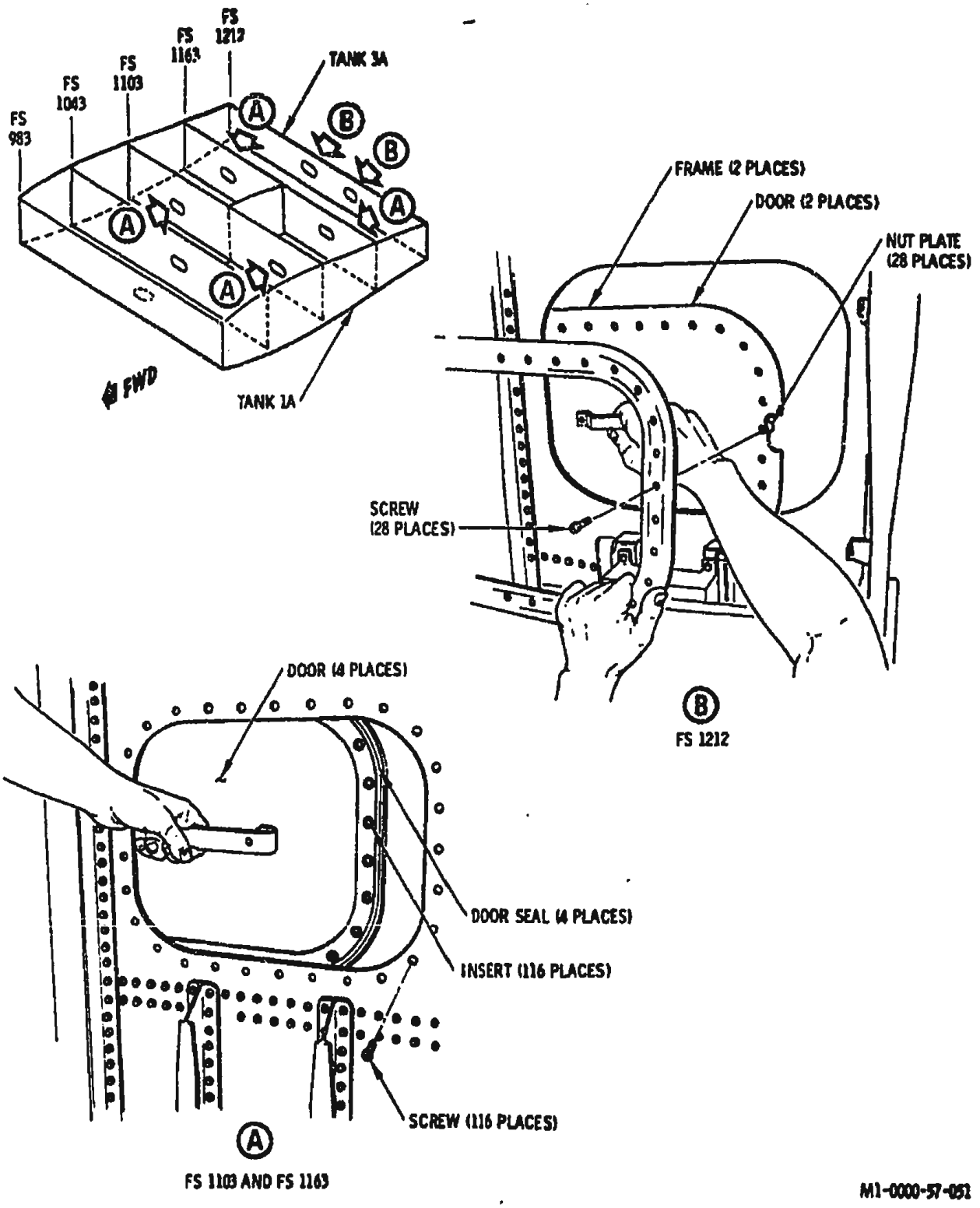
(11) Remove excess grease from around door gap and clean as required for application of sealant

(12) Apply sealing compound to fill gap between access door and wingskin (Ref. 20-51-04).

CENTER SECTION FUEL TANK, ACCESS DOORS - DESCRIPTION AND OPERATION

1. General

Access into the center section fuel structure is through three openings, on the lower surface there is one located at FS 985 and two located at FS 1212. Large holes through rib webs inside the center section fuel tank provide a crawl path for fuel tank maintenance operations in adjacent bays. The doors are of aluminum alloy, pressure die-cast construction, with integral stiffeners and bosses which house the insert nuts. The attachment screws have a thread length which limits the engagement depth into the encapsulated dome nuts for protection of the dome against damage or penetration. The doors with seal is cemented into the grove (Ref. Fig. 1).



Center Section Fuel Tank, Access Doors
Figure 1

CENTER SECTION FUEL TANK ACCESS DOORS - REMOVAL AND INSTALLATION

1. General

This removal and installation procedure is applicable to all doors of the center section fuel tank and dry bay (Ref. 6-50-00).

NOTE: Fuel tanks can be left open and dry for an indefinite period of time with no adverse effect.

2. Equipment and Materials

Anticorrosion Grease, Aeroshell 14 (MIL-G-25537), or equivalent

3. Referenced Procedures

6-50-00	Interior Access Doors and Panels
12-11-00	Fuel Tank Replenishing
20-24-04	Grounding Connections
20-51-01	Wrench Torque Values
28-11-00	Fuel Tanks - Maintenance Practices
28-11-00	Tanks - Inspection and Check
28-21-00	Pressure Fueling System - Description and Operation
28-22-00	Defueling System - Description and Operation

4. Removal/Installation

WARNING: FUEL TANKS CONTAIN EXPLOSIVE VAPOR. OBSERVE ALL APPLICABLE SAFETY REQUIREMENTS AS SPECIFIED IN 28-11-00.

A. Removal

(1) Defuel appropriate 1A or 3A fuel tank (Ref. 28-22-00).

R (2) On aircraft without SB57-165,
R remove access door fasteners and retain for
R reinstallation (Ref. Fig. 401).

R (2) On aircraft with SB57-165,
R remove fastener securing bonding strap to access door
R (Ref. Fig. 402). Remove remaining access door
R fasteners and retain for reinstallation (Ref. Fig.
R 401).

(3) Remove access door frame where applicable.

(4) Push access door in and remove.

CAUTION: PROTECT ACCESS DOOR SEAL CONTACT AREA DURING SERVICE OPERATIONS.

(5) Purge fuel tank (Ref. 28-11-00).

(6) Place suitable protective cover over access opening as required.

B. Installation

(1) Check access door for condition of fasteners and access door seal ring. Check access door seal contact area on center section fuel tank for cleanliness and surface condition.

CAUTION: DO NOT APPLY EXCESSIVE ANTICORROSION GREASE. ANTICORROSION GREASE MUST NOT BE SQUEEZED INTO THE TANK AREA WHEN DOOR IS IN POSITION.

(2) Apply anticorrosion grease to access door directly inside of the molded rubber seal. Grease on rubber
R seal is permitted.

R (3) On aircraft without SB57-165,
R position access door in place and install fasteners
R (Ref. Fig. 401).

R (3) On aircraft with SB57-165,
R position access door in place and install bonding strap
R and door fasteners (Ref. Fig. 401 and 402).

R NOTE: Bonding strap should be installed on upper
R center door fastener.

R (a) Bond the bonding strap in accordance with
R 20-24-04.

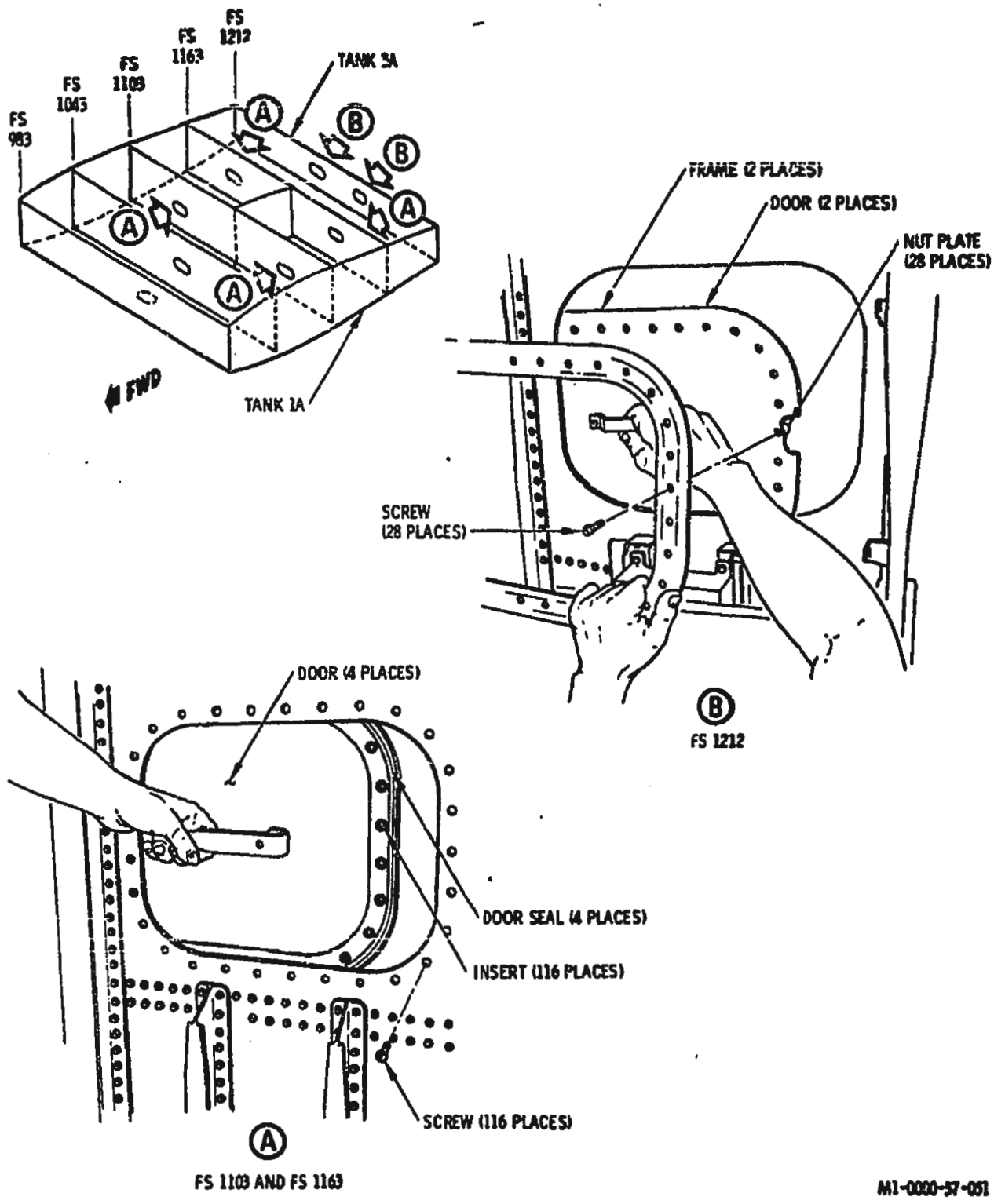
(4) Torque fasteners (Ref. 20-51-01).

(5) Wipe off excessive grease.

(6) Check electrical resistance of access door to center section fuel tank (Ref. 20-24-04).

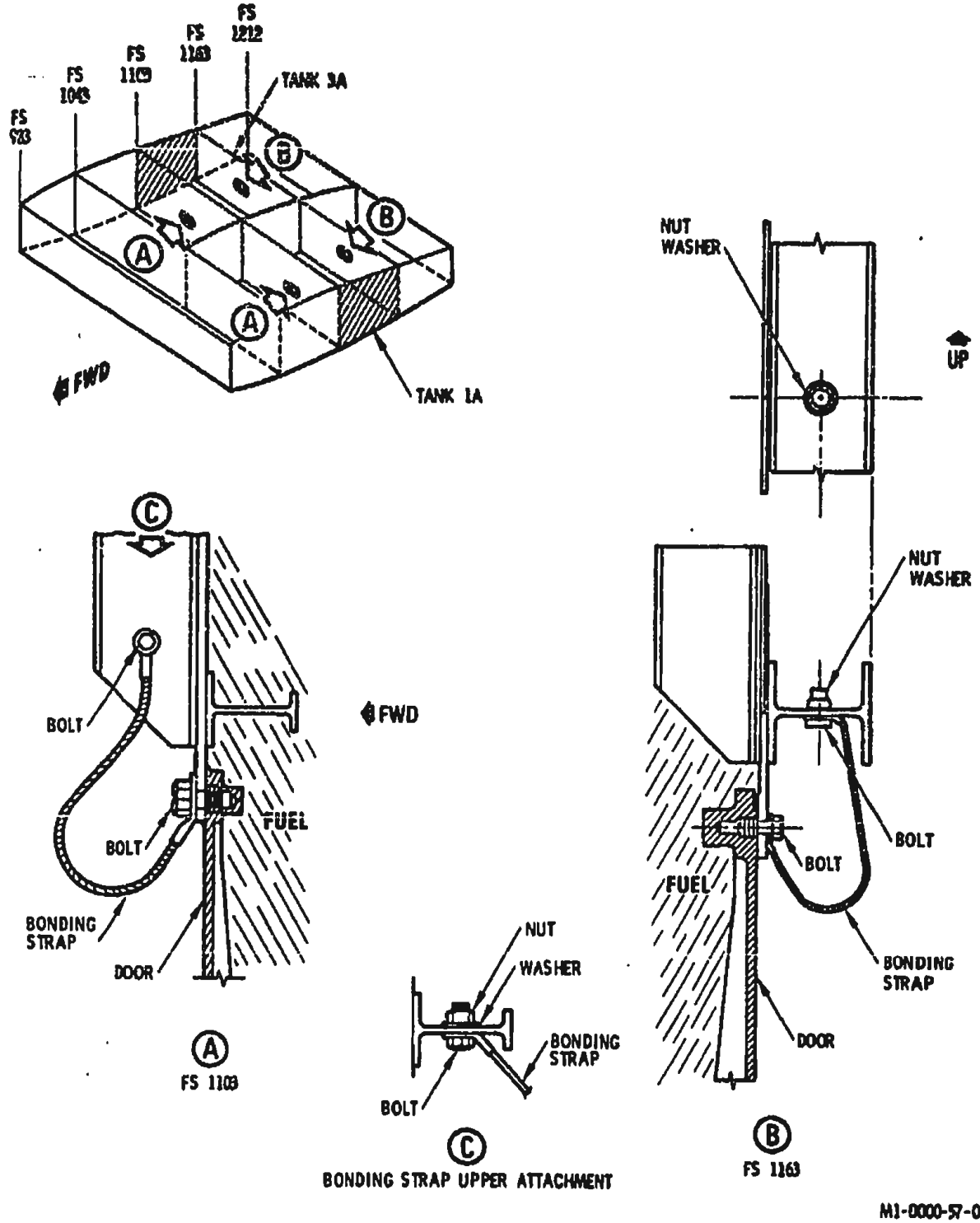
NOTE: Electrical resistance for installed access door between door and center section fuel tank must not exceed 1.0 ohm.

(7) Replenish appropriate center section fuel tank (Ref. 12-11-00) and perform leak check (Ref. 28-11-00).



Center Section Fuel Tank, Access Doors
Figure 401

R EFFECTIVITY: 025, 026, 028-036
R
001B



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R Access Door Bonding Strap - Removal and Installation
R Figure 402

R EFFECTIVITY: AIRCRAFT WITH SB57-165
R
001B

FIXED TRAILING EDGE SKIN - DESCRIPTION AND OPERATION

1. General

The upper and lower fixed trailing edge skins (Ref. Fig. 1) are made of aluminum honeycomb core panels, compressed aluminum honeycomb core panels, and aluminum sheet panels.

A. Upper Surface Panels

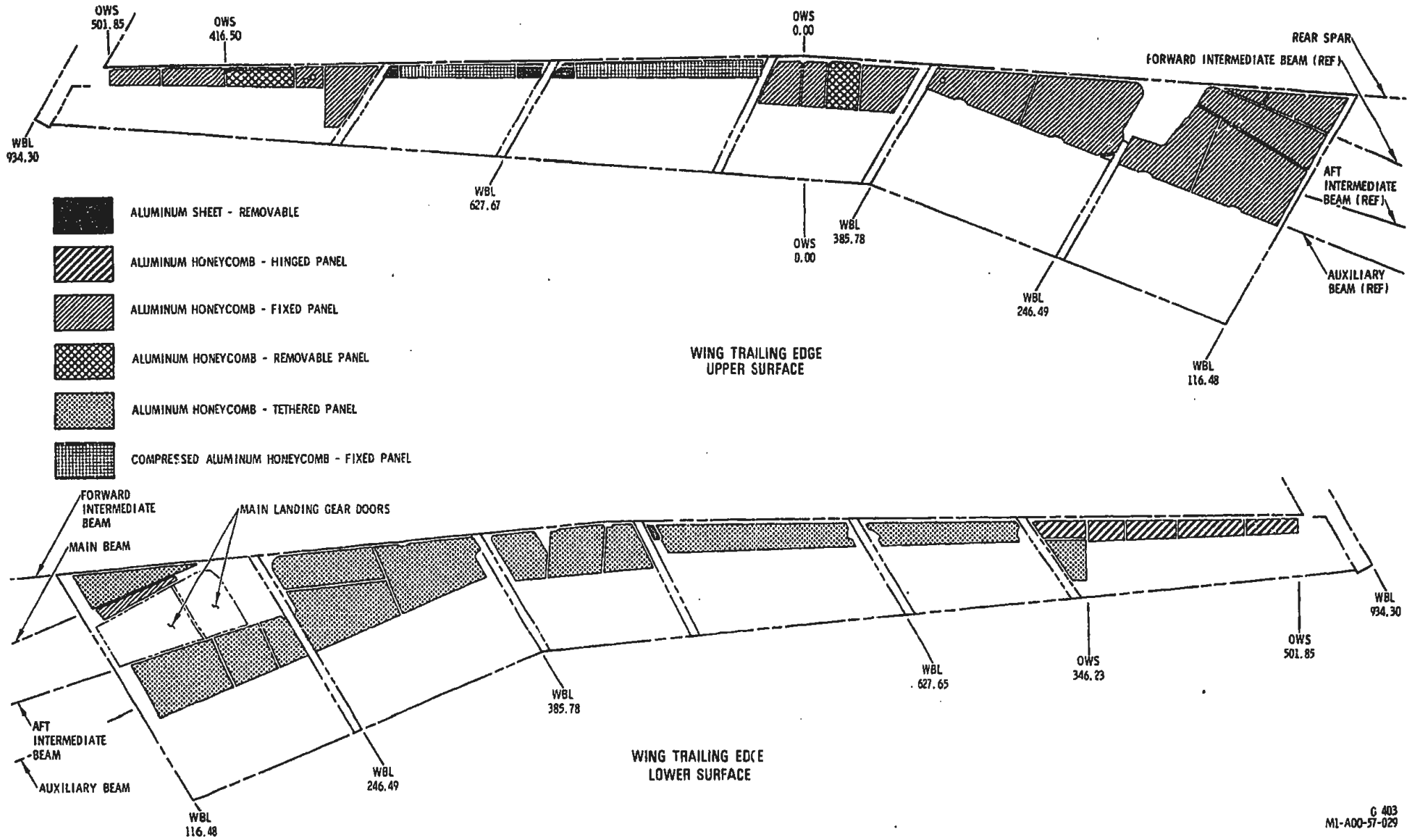
The upper trailing edge structure inboard of the pylons is covered with six aluminum honeycomb and three small compressed aluminum-honeycomb core panels that are permanently joined to the substructure.

The upper skin panels outboard of the pylons are of two configurations. The fixed panels forward of the two outboard flaps are compressed aluminum honeycomb. The fixed panels forward of both ailerons are aluminum honeycomb with fiber-glass-reinforced closeout edging. The trailing edge of the panels have aerodynamic seals where they interface with flight control surfaces.

B. Lower Surface Panels

The lower surface panels inboard of the pylon are of honeycomb construction. These nonstructural, tethered access panels have single-length captive screws. One fixed panel on the lower inboard area forms the forward edge of the main landing gear cavity. This panel is made of compressed aluminum honeycomb sandwich and is riveted to the substructure. Nylon tether straps fastened to the forward inside edges retain the panels when they are opened.

The lower panels forward of the outboard aileron are of aluminum honeycomb sandwich construction. These panels are hinged on the forward side and attached with screws. All panels trailing edges have aerodynamic seals.



Fixed Trailing Edge Skins and Access Panels
Figure 1

EFFECTIVITY: ALL

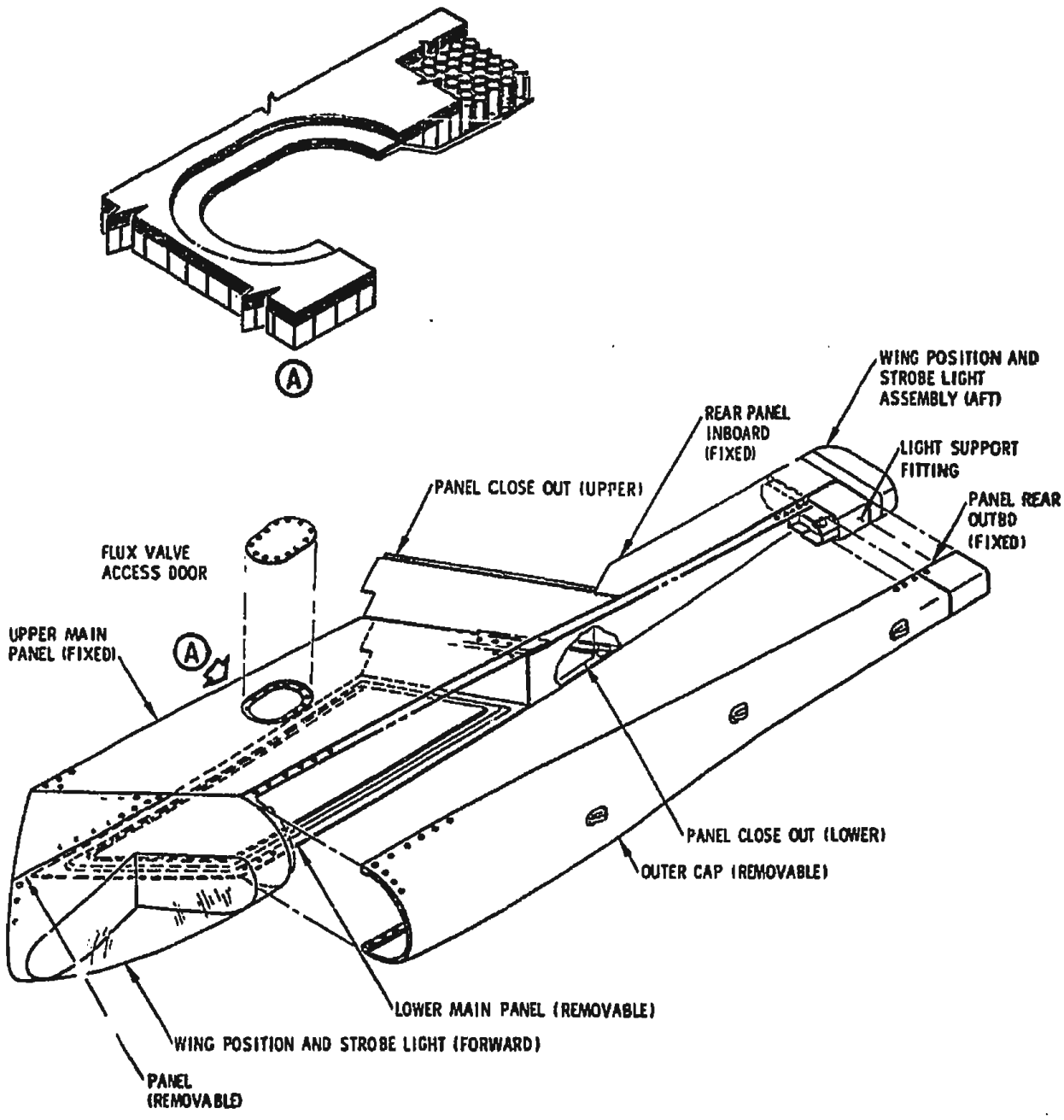
050

WINGTIP SKIN - DESCRIPTION AND OPERATION

1. General

The wingtip skin surfaces (Ref. Fig. 1) consist of a double-contoured, outer cap of aluminum alloy, upper and lower forward aluminum honeycomb sandwich panels, two aluminum close out panels in the middle section, and upper and lower fixed aluminum panels along the aft section inboard of the end cap. The removable panels consist of the lower forward honeycomb panel and the outer cap panel. Transparent lens panels enclose the forward and aft wing position light assemblies.

R A removable aluminum plate is located in the upper forward
R honeycomb panel for access to the flux valve.



HH 4460
M1-A00-57-030

Wingtip Skins and Panels
Figure 1

WING TIP CAP - REMOVAL AND INSTALLATION

R 1. Equipment and Materials

R Torque wrench

R 2. Referenced Procedure

R 20-51-02 Preparation for and Installation of Mechanical
R Fasteners

R 3. Removal/Installation

A. Removal

(1) Remove noncaptive screws (Ref. Fig. 401, Details A and B). Retain and mark noncaptive screws separately for front and rear installation (screws are of different lengths).

(2) Unfasten captive fasteners and remove wing tip cap.

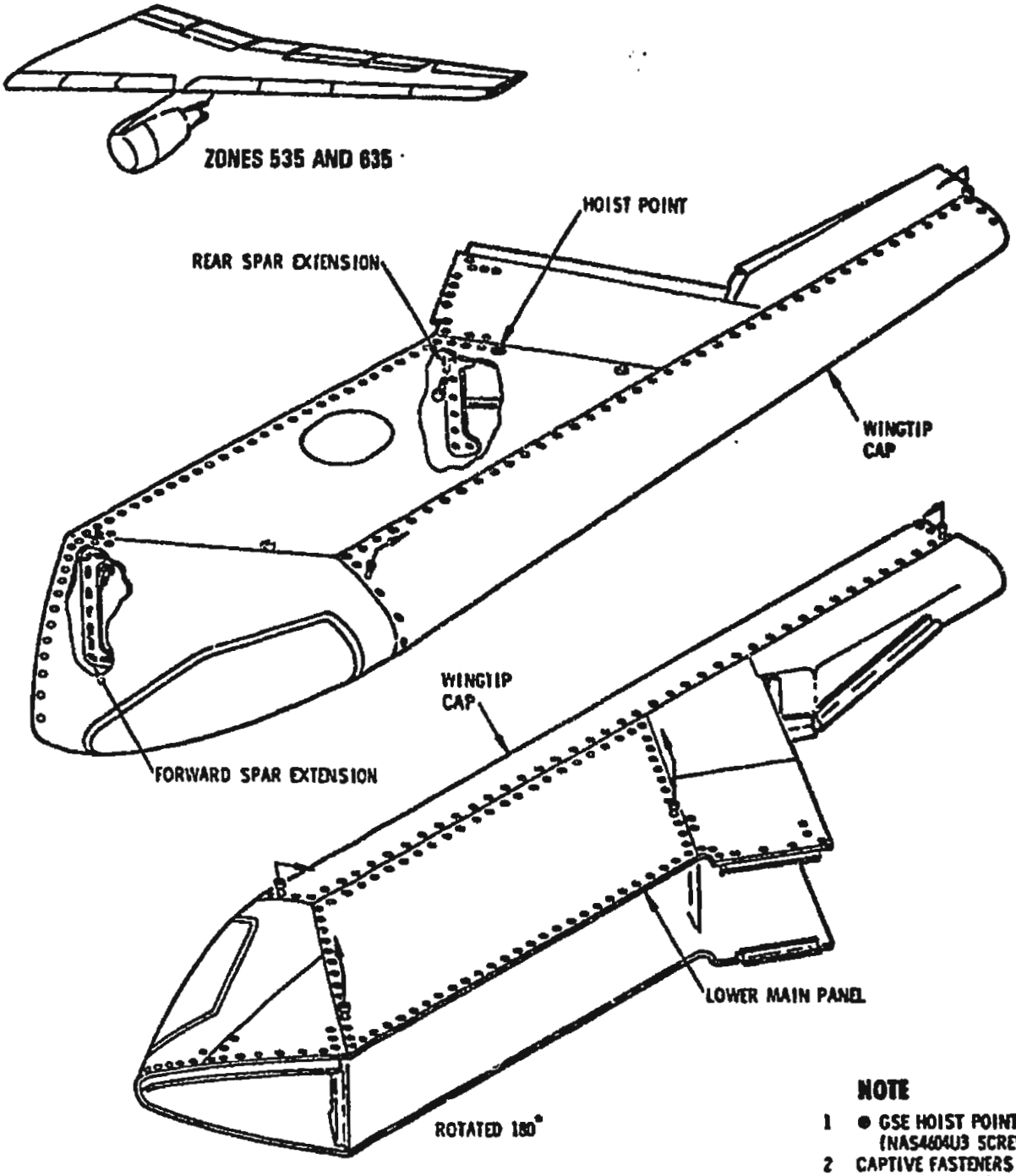
B. Installation

(1) Position wing tip cap in place and loosely attach some of the captive fasteners.

R (2) Install noncaptive screws (Ref. Fig. 401).

(3) Install all captive fasteners.

NOTE: Captive (reduced shank) type screws will be torqued to same value as noncaptive screws of
R same size (Ref. 20-51-02).



NOTE

1. ● GSE HOIST POINT (NAS4604U3 SCREW)
2. CAPTIVE FASTENERS BETWEEN ARROWS

HH 8446
M1-0100-57-040

R Wing Tip Cap - Removal and Installation
R Figure 401

ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General

Fittings used as a connection between main structural parts include wing terminal fittings, landing gear attach fittings, pylon attach fittings, wingtip attach fittings, flight control attach fittings, and wing equipment attach fittings.

WING-TO-FUSELAGE ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General

The wing terminal fittings are heavy flanged forgings. Four of these fittings are used during mating of the outer wings to the wing center section. The fitting flanges mate with fittings at the four corners of the center wing box assembly.

LANDING GEAR-TO-WING ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General

The main landing gear strut fittings (Ref. 57-14-00, Fig. 1) are located inboard in the trailing edge structure at approximately IWS 346. The fittings are forged 4340 steel. The fittings are components of the main landing gear torque box. Lugs on this fitting provide all the wing attach points for the main landing gear shock strut.

PYLON-TO-WING ATTACH FITTINGS - DESCRIPTION AND OPERATION

1. General

A three-point support system attaches the engine pylon to the wing structure. Two forward support fittings machined from 6AL-4V titanium forgings, are mounted on the front spar. The fittings are approximately 18.5 inches center-to-center and symmetrical about the centerline of the pylon. The aft support fitting is attached to the wing box lower surface along the pylon centerline. Two large I-section beams span the forward and aft fittings. The beams are attached to the wing lower surface, using the wing box skin as the upper close-out member of the pylon.

R PYLON DRAG STRUT AFT SUPPORT FITTING BEARING
R MAINTENANCE PRACTICES

R 1. General

R A pylon drag strut aft support fitting bearing can be replaced
R with an engine installed or removed.

R In each case the engine or pylon must be properly supported to
R prevent damage to the aircraft.

R 2. Equipment and Materials

R Bearing, KSSB36-20, or approved equivalent

R Tool Kit Box EL014A1-1, consisting of: Bearing Removal and
R Installation Tools

R 3. Referenced Procedures

R	7-11-00	Wing and Fuselage Jacking - Maintenance Practices
R	12-26-02	Wing Pylon Attach Fittings Lubrication - Servicing
R	54-00-03	Pylon/Wing Attach Bolts - Removal and Installation With Wing Engine Installed
R	54-00-04	Pylon/Wing Attachment Bolts - Removal and Installation With Engine Removed
R	71-00-01	Wing Mounted QEC Unit - Removal and Installation
R	71-11-01	Left-Hand Hinged Cowl - Removal and Installation
R	71-11-02	Right-Hand Hinged Cowl - Removal and Installation

R 4. Aft Bearing Access

R WARNING: BEFORE REMOVING DRAG STRUT AFT ATTACHMENT BOLT,
R PROVIDE ADEQUATE SUPPORT FOR DRAG STRUT. DRAG STRUT
R WEIGHS APPROXIMATELY 380 POUNDS.

R A. On Aircraft With Engine Installed,

R (1) Prepare for drag strut aft attachment bolt removal
R [Ref. 54-00-03,401 Steps 4A(1) through (13)].

R A. On Aircraft With Engine Removed,

R (1) Prepare for drag strut aft attachment bolt removal
R [Ref. 54-00-04,401, Steps 4A(1) through (8)].

R 5. Bearing Removal/Installation

R A. Removal

R (1) Verify that drag strut is adequately supported by means
R of nylon strap or equivalent.

R (2) Disconnect clamps or brackets attached to drag strut
R that can interface with drag strut movement.

R (3) Disconnect hydraulic flex lines that are routed
R parallel to drag strut at rear connection.

R NOTE: It may be necessary to disconnect these lines at
R forward end to prevent damage when drag strut is
R moved.

R (4) Loosen, but do not remove, two nuts at forward end of
R drag strut.

R (5) On aircraft with engine installed,
R remove nut and bolt from drag strut aft attachment
R point as described in 54-00-03,401 Steps 4B(1)(a)
R through (h).

R (5) On aircraft with engine removed,
R remove nut and bolt from drag strut aft attachment
R point described in 54-00-04,401 Steps 4B(1) through
R (4).

R (6) Move drag strut away from wing fitting a minimum
R distance as required to clear bearing work area.

R (7) Remove bearing from wing skate angle aft fitting as
R follows:

R (a) Insert bushing (EL422H7-108, DET.-201) into
R bearing (Ref. Fig. 201).

R (b) Using C-clamp, clamp the above bearing
R (EL422H7-108, DET.-201) on 1527342 wing fitting.

R (c) Insert hole saw (EL422H7-108, DET.-101) in motor
R spindle of yoke assembly (CL225X31-1).

R (d) With clamp spindle end of yoke hinged back, insert
R pilot of tool into pilot hole of bushing on
R opposite side of bearing flange.

R (e) With pilot engaged in bushing, close hinge of
R clamp spindle end and lock with pin. Turn clamp
R spindle until both pilots are inserted into
R bushing and slack is taken up. Move yoke assembly
R (CL225X31-1) up tight against bushing to prevent
R wobble.

R (f) Turn on motor and adjust valve (on opposite end of
R motor from spindle) to reach slower and more
R controllable speed, using wrench (CL225X31-1,
R DET.-233).

R (g) Carefully cut away bearing flange and remove
R bearing.

R B. Installation

R (1) Verify wing fitting is clean and free of chips or other
R contamination.

R (2) Install new bearing as follows:

R (a) Insert bearing into wing skate angle aft fitting.

R (b) Insert bushing (EL422H7-108, DET.-201) into
R bearing, and using C-clamp, clamp bushing to skate
R angle aft fitting.

R (c) Install staking tool (EL325B15-146) in motor
R spindle of yoke assembly (CL225X31-1).

R (d) With clamp spindle end of yoke hinged back, insert
R pilot of tool into pilot hole of bushing on
R opposite side of bearing flange.

R (e) With pilot engaged in bushing, close hinge of
R clamp spindle end and lock with pin. Turn clamp
R spindle until both pilots are inserted into
R bushing and slack is taken up. Move yoke assembly
R (CL225X31-1) up tight against bushing to prevent
R wobble.

R (f) Swage bearing until bearing flange has a minimum
R diameter of 3.56 inch, or a feeler gage
R penetration check passes close inspection (Ref.
R Fig. 202).

R NOTE: After installation, any crack visible to
R the naked eye shall be cause for rejection
R of bearing.

R (3) On aircraft with engine installed,
R install drag strut aft bolt, washers and nut as
R described in 54-00-03,401, Steps 4B(2)(a) through (h).

R (3) On aircraft with engine removed,
R install drag strut aft bolt, washers and nut as
R described in 54-00-04,401 Steps 4C(1) through (8).

R (4) Reinstall fluid lines if disconnected.

R (5) Reinstall clamps, brackets etc. disconnected in Steps
R 5A(2) and (3).

R (6) With wrench on bolt heads to prevent turning, torque
R drag strut inboard and outboard forward nuts to 1400 to
R 1500 pound-inches, and lubricate (Ref. 12-26-02).

R (7) On aircraft with engine installed,

R CAUTION: VERIFY THAT WORKSTANDS AND EQUIPMENT IS CLEAR
R OF AIRCRAFT BEFORE REMOVING ENGINE SUPPORT.

R (a) Remove overhead crane support or equivalent
R support from engine.

R (b) Install engine cowling (Ref. 71-11-01 and
R 71-11-02).

R (c) Install panels 452/462 FR, 452/462 FL, 453/463 GR,
R 453/463 GL, 453 DR and 463 DL, 453/463B and
R 453/463C.

R (d) Remove workstands and platforms.

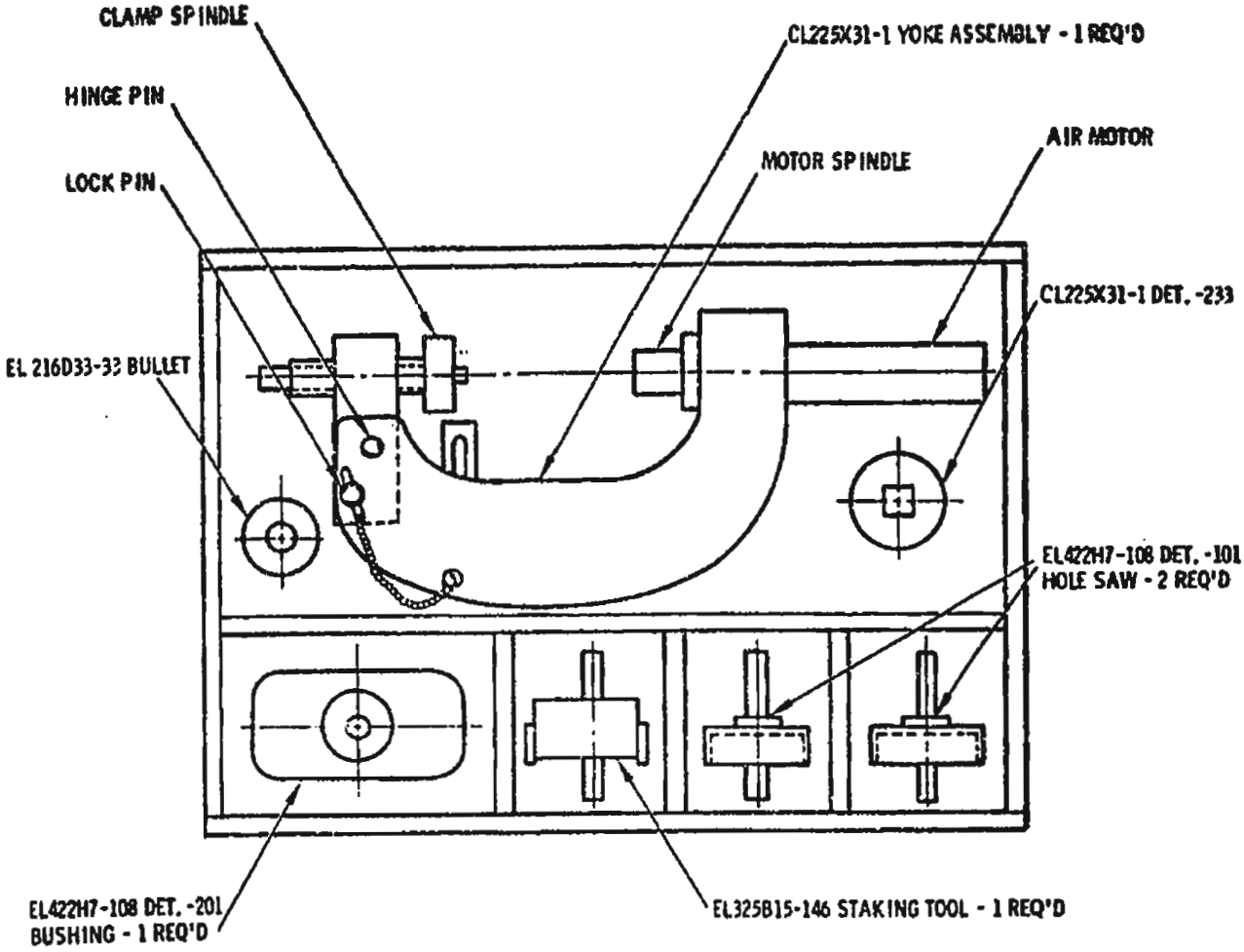
R (e) Lower aircraft and remove stabilizing jacks, as
R required (Ref. 7-11-00).

R (f) Close applicable engine 1 or 3 circuit breakers.

R (g) Verify fuel shutoff and hydraulic shutoff valves
R are returned to open position.

R (7) On aircraft with engine removed,

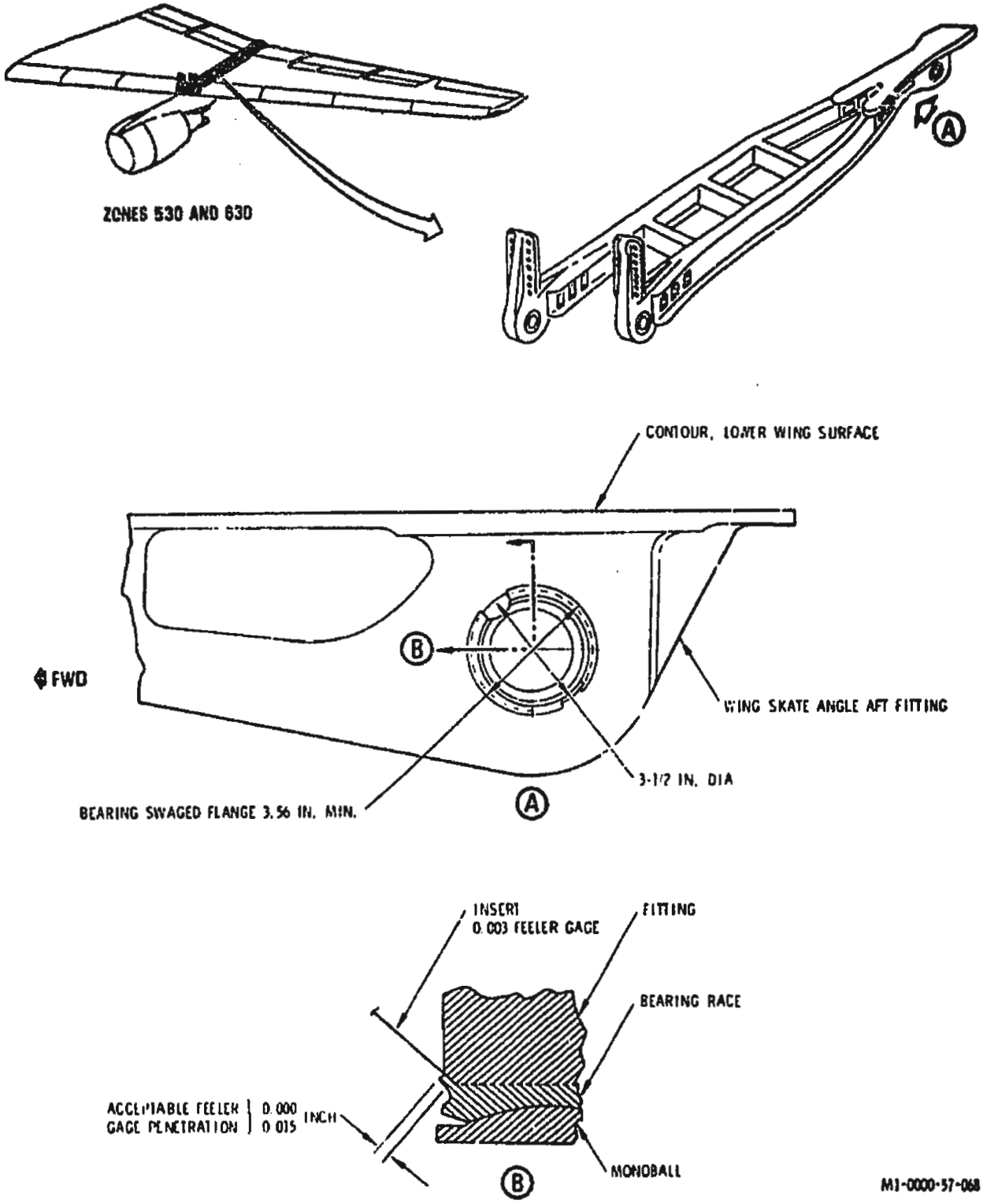
R (a) Perform completion procedure [Ref. 54-00-04,401,
R Steps 4H(1) through (7)].



M1-0000-57-067

R Bearing Removal/Installation
R Figure 201

R EFFECTIVITY: ALL
R
001B



R Pylon Drag Strut Aft Support Fitting Bearing
R Figure 202

R EFFECTIVITY: ALL
R
0018

FLIGHT SURFACES - DESCRIPTION AND OPERATION

1. General

The flight control surfaces (Ref. Fig. 1) consist of slats, spoilers, vanes, flaps and ailerons.

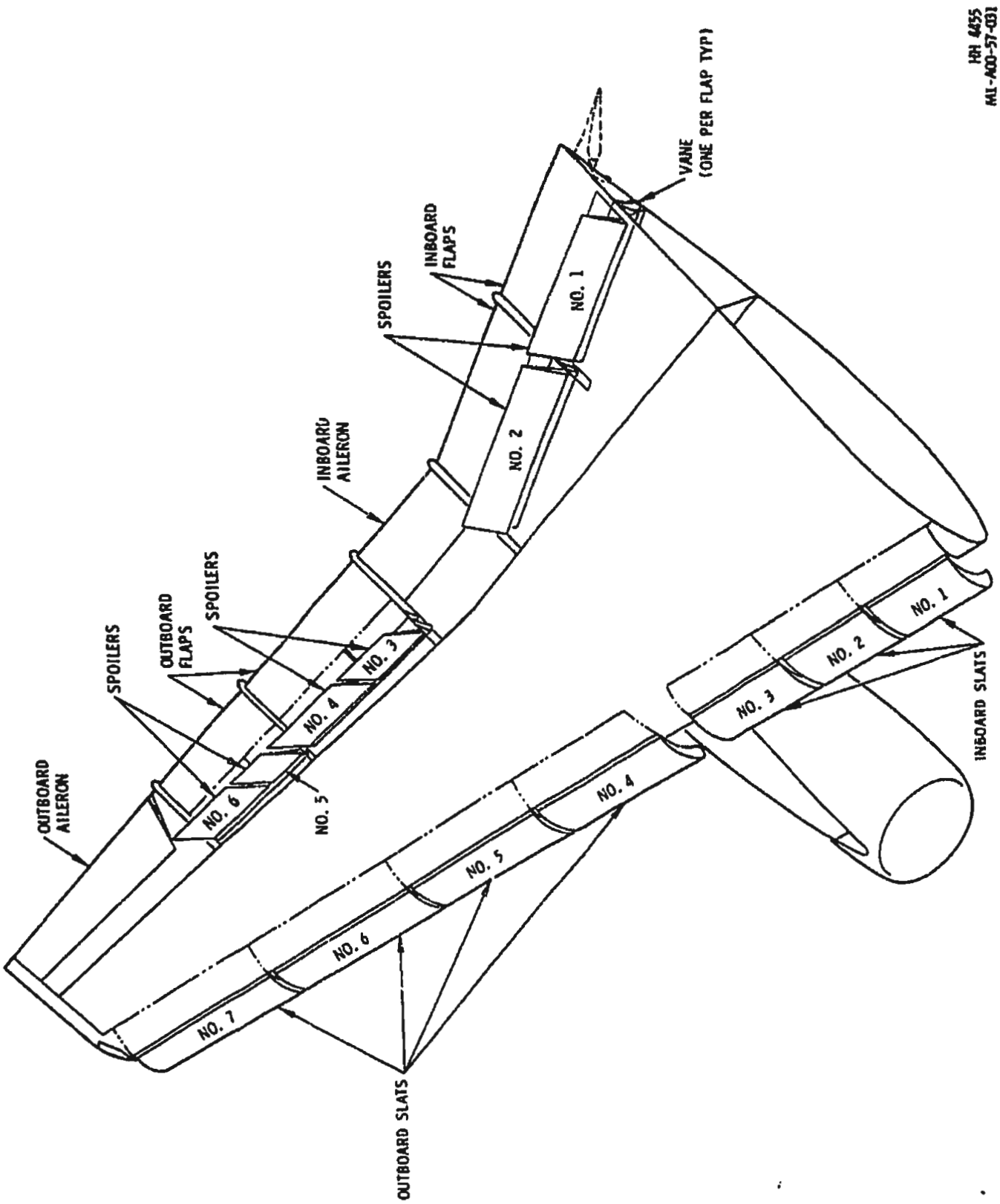
Seven slats are provided on the leading edge of each wing. The slats, when retracted, form the front profile of the wing ahead of the fixed leading edge structure. The four outboard slats only are provided with an anti-icing system. The slats serve as airflow control devices during takeoff and landing.

Six aerodynamic spoilers are provided to assist roll control, to serve as air brakes, and to spoil lift during and after landing. The spoilers are located on the upper surface of the wing above the trailing edge flaps.

Four vane assemblies are located on each wing. A vane assembly is mounted just ahead of each trailing edge landing flap. The vanes are supported by carriages operating in tracks mounted in the torque boxes. Each vane is operated by linkages connecting the flap and vane. The vane serves to improve the aerodynamic characteristics of the flap.

Four flap assemblies are located on each wing. Two flaps assemblies are mounted inboard and two are mounted outboard of the inboard aileron. Each flap with its associated vane assembly forms a double-slotted Fowler-type flap. Each flap assembly is supported by rollers, linkages, and tracks on full-depth ribs (torque boxes). The flaps are extended or retracted by jackscrew assemblies.

Two aileron assemblies are located on each wing. The outboard aileron is mounted near the wingtip, and the inboard aileron is mounted inboard of the two outboard flaps. The ailerons are attached by hinge fittings to the wing rear spar. There are two hinges on each inboard aileron and four on each outboard aileron.



Flight Control Surfaces
Figure 1

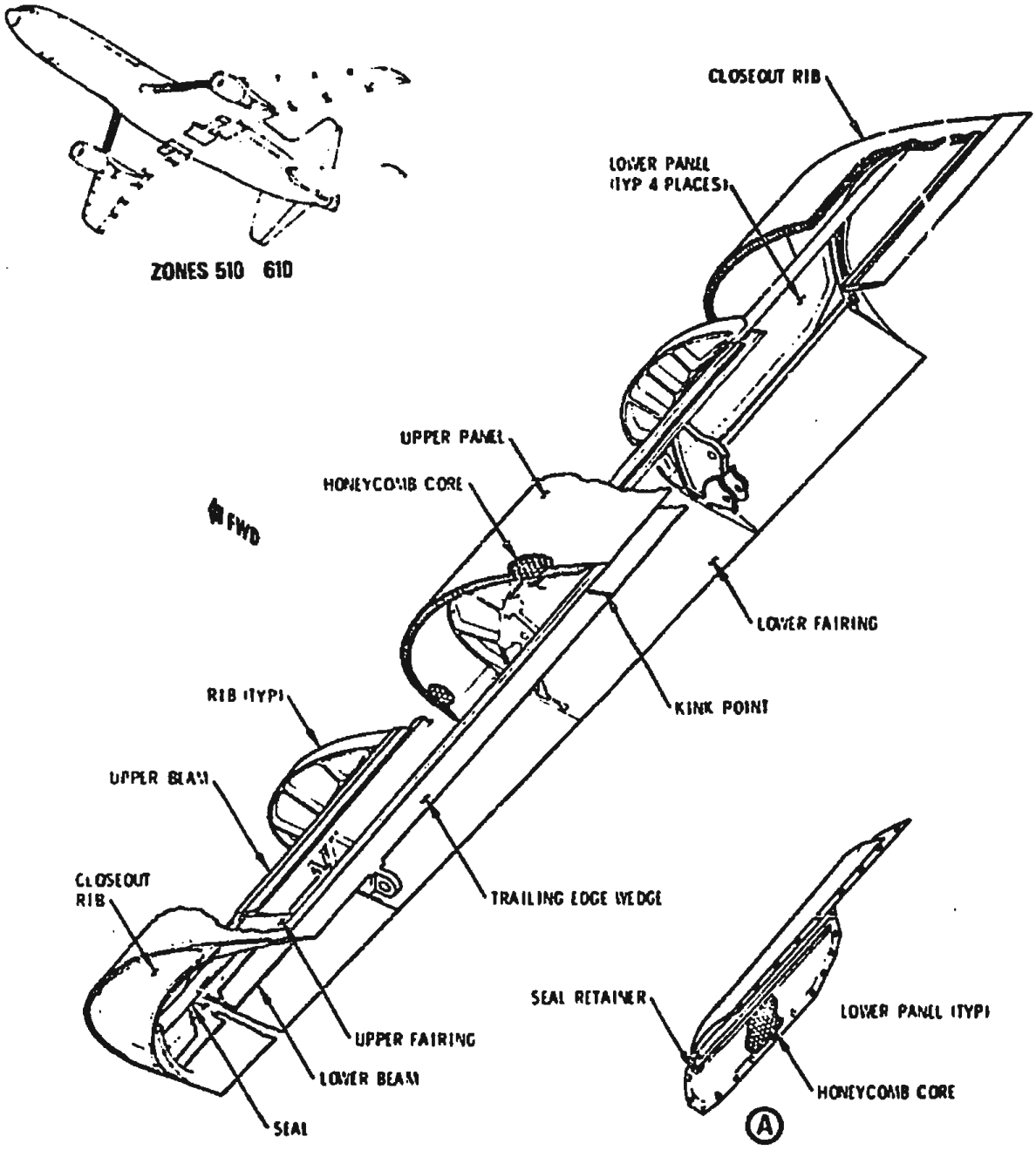
SLATS - DESCRIPTION AND OPERATION

1. General

There are seven slotted slats (Ref. Fig. 1 and 2) on each wing leading edge. Three slats are located inboard of the engine support pylon, and four slats outboard of the pylon. The outboard slats are provided with a hot air anti-icing system. A short length of fixed, unslatted leading edge structure is located between the inner slat and the fuselage.

R Inboard slats are constructed of aluminum honeycomb sandwich or
R of sheet metal panels supported by machined-forged ribs. The outboard slats are of sheet metal and forged ribs.

Each inboard slat is approximately nine feet long and thirty inches wide. The slat consists of one outer and four inner honeycomb surface panels. The four inner panels of each inboard slat are removable. Each outboard slat is approximately 13 feet long and 24 inches wide. Each slat consists of three sections: the nose section, center section, and trailing edge. A front and rear spar connects these sections. Each outboard slat has two snubbers, an actuator rib, two track support ribs, intermediate ribs, and a hot air distribution duct. Each slat has a flexible seal interconnecting the ends of each slat. The trailing edge of each slat consists of a nylon arrowhead extrusion to prevent chafing of the fixed leading edge structure when the slat is stowed.



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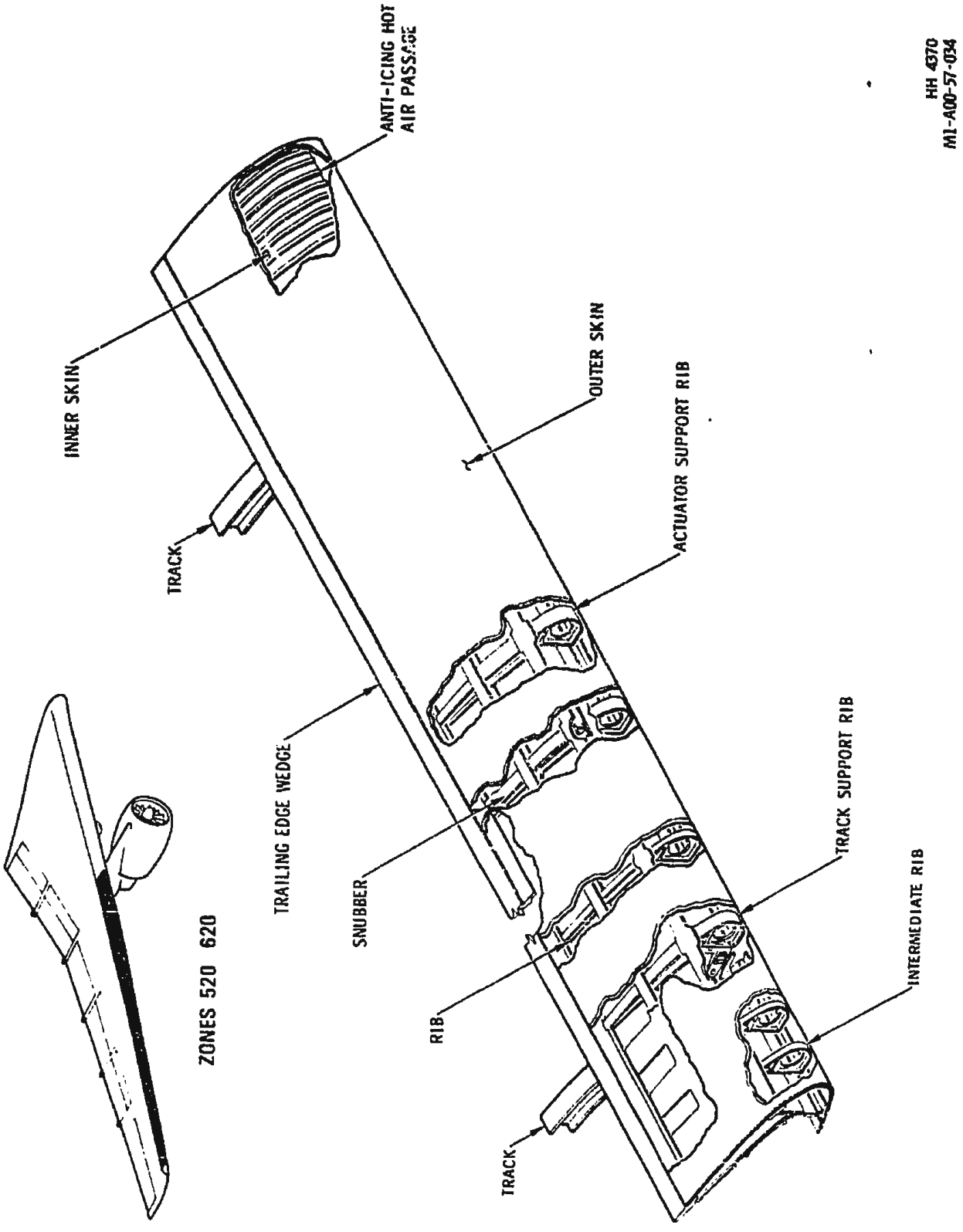
Leading Edge Slats, Inboard
Figure 1



Leading Edge Slats, Outboard
Figure 2

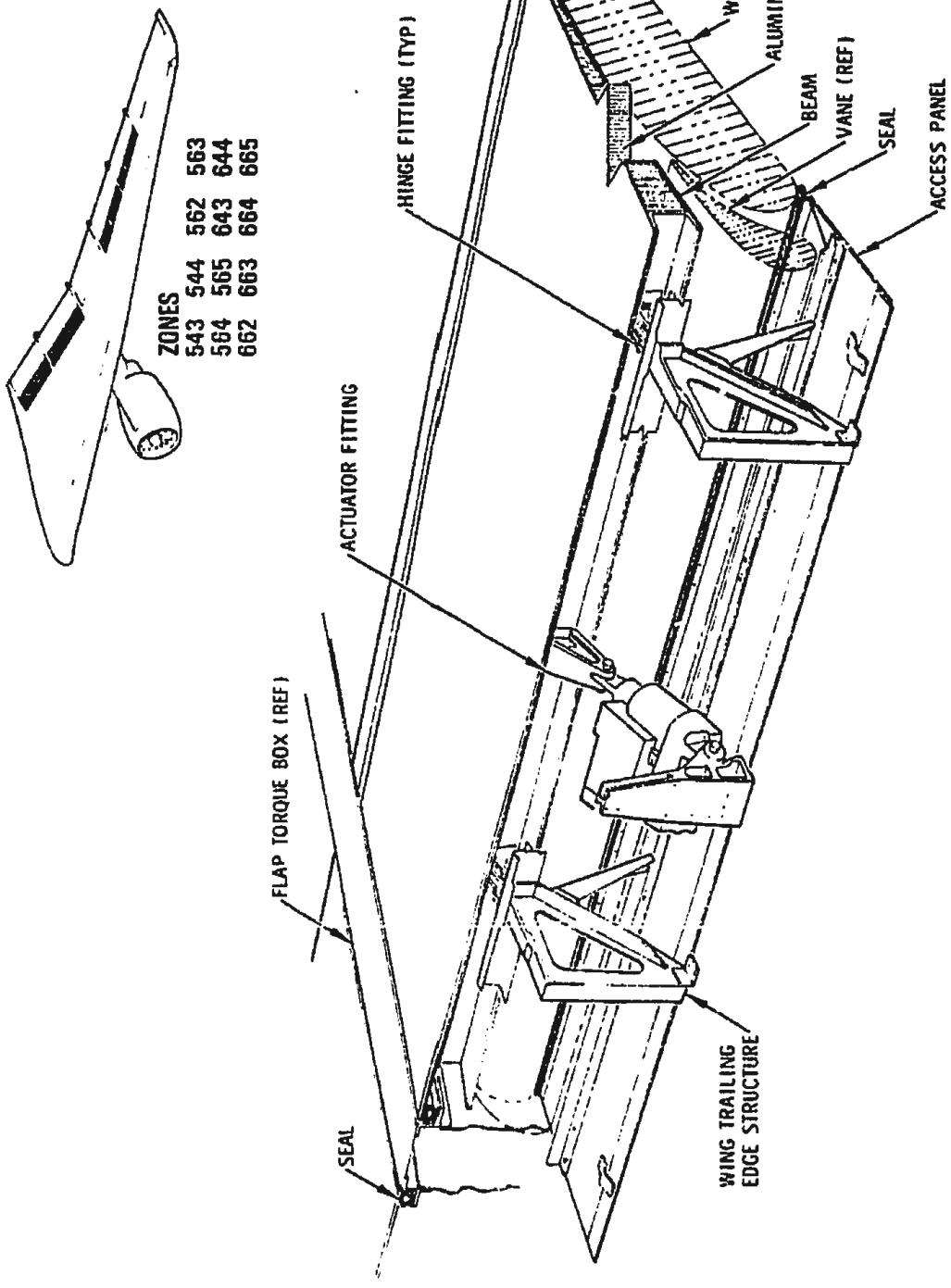
SPOILERS - DESCRIPTION AND OPERATION

1. General

Six spoiler assemblies (Ref. Fig. 1) are mounted on the trailing edge structure of the wing.

All spoiler panels are bonded aluminum honeycomb assemblies. The bonded panel assemblies consist of aluminum sheet skins; a full depth, contoured, aluminum honeycomb wedge; a channel front beam; formed sheet end closure ribs which are flanged outward; and an extruded metal channel trailing edge closure. The gaps between spoilers that do not interface with fixed trailing edge structure have flat strip seals attached to the spoiler side edges to form a butt joint with the adjacent spoiler.

HH 4354
M1-A00-57-035



Spoilers
Figure 1

FLAP VANES - DESCRIPTION AND OPERATION

1. General

Vane assemblies (Ref. Fig. 1) are made of aluminum sheet metal. The assemblies consist of:

Machined aluminum carriage support fittings at each end

A beam composed of T-caps

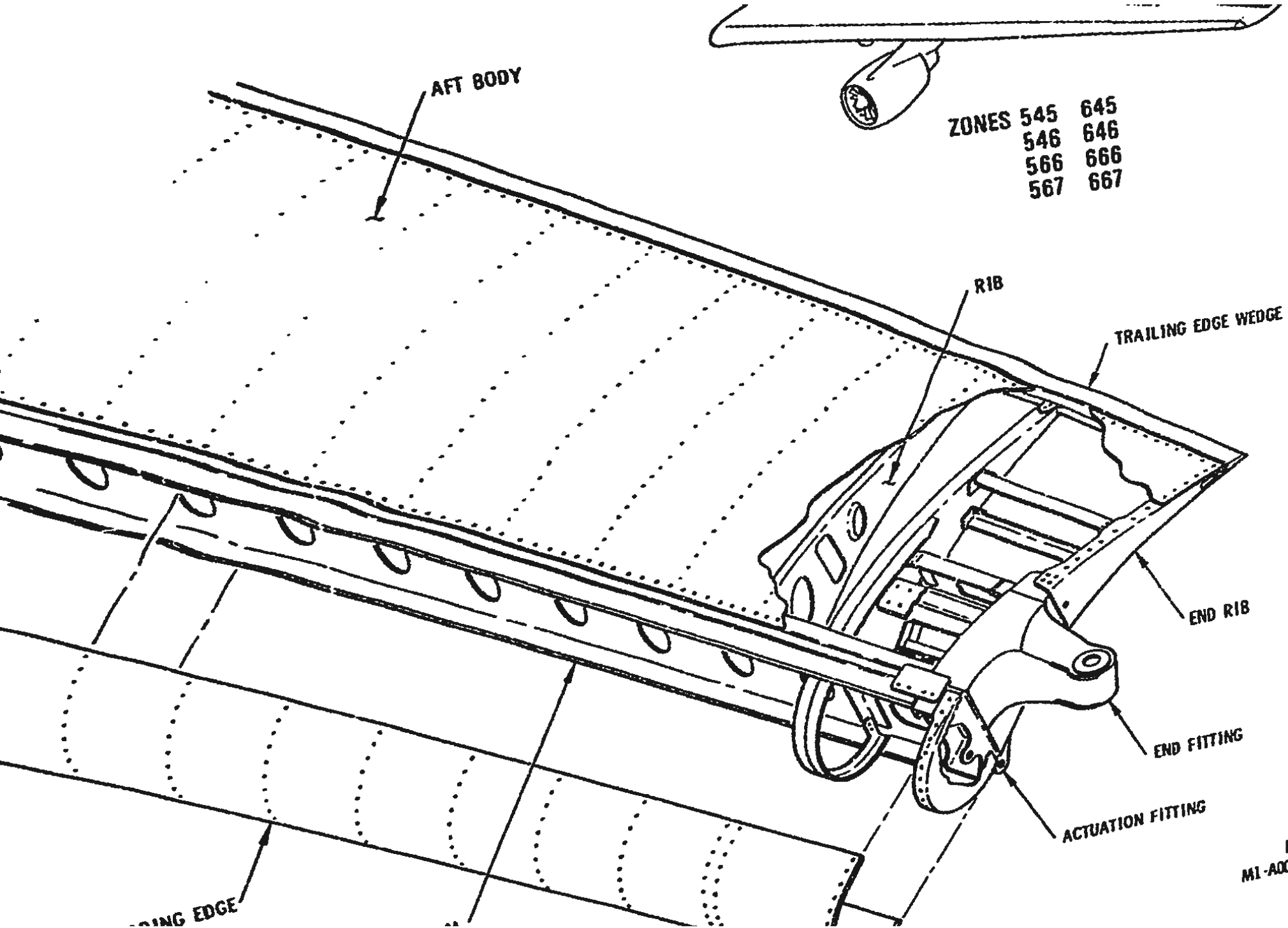
A web with lightening holes and stiffeners

An aluminum alloy extruded arrowhead trailing edge

Sheet metal skins with bonded doublers

Sheet metal former ribs

The upper and lower surface panels are attached with rivets. The leading edge nose section is removable and is attached with screws and nut plates. The leading edge is removable, and access to the aft section is achieved through holes in the beam web.


AFT BODY
ZONES 545 645
546 646
566 666
567 667
RIB
TRAILING EDGE WEDGE
END RIB
END FITTING
ACTUATION FITTING
ING EDGE

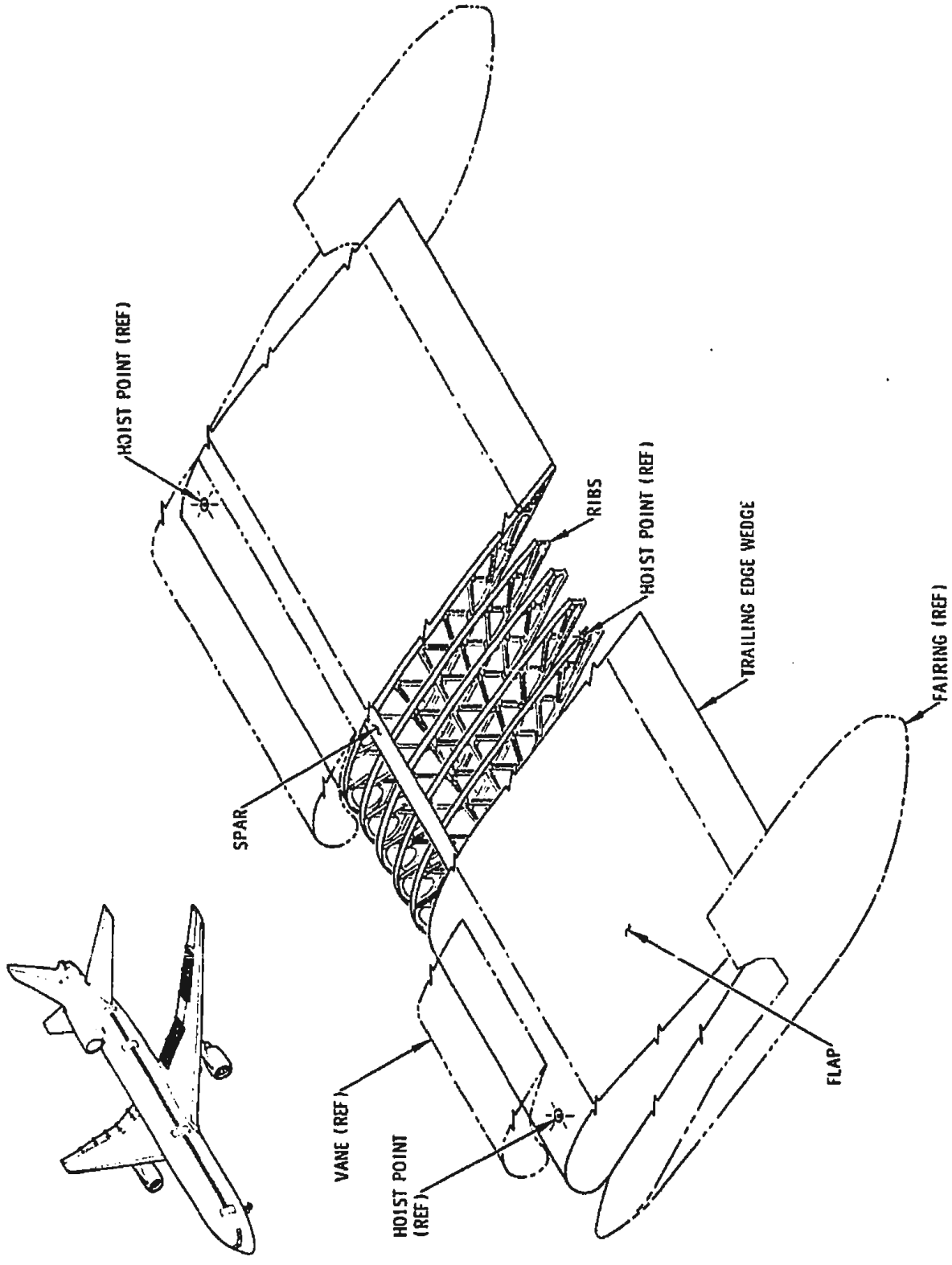
FLAPS - DESCRIPTION AND OPERATION

1. General

The flap (Ref. Fig. 1) is of conventional aluminum alloy sheet construction. Each flap has a forward and an aft beam (consisting of T-caps, webs, and stiffeners); web and stiffener ribs; air load ribs, (consisting of T-caps with extruded truss members); an extruded panel support member near the nose; machined aluminum track support fittings with supporting sheet metal to form the flap end ribs; interchangeable titanium tracks; sheet metal skins with bonded doublers; and interchangeable trailing edge segments made from crushed aluminum honeycomb core panels wrapped around the trailing edge radius.

Lower surface panels are attached with screws and nut plates for access and inspection. The leading edge and upper surface panels are permanently attached.

HH 4368
M1-A00-57-038



Flaps
Figure 1

AILERON - DESCRIPTION AND OPERATION

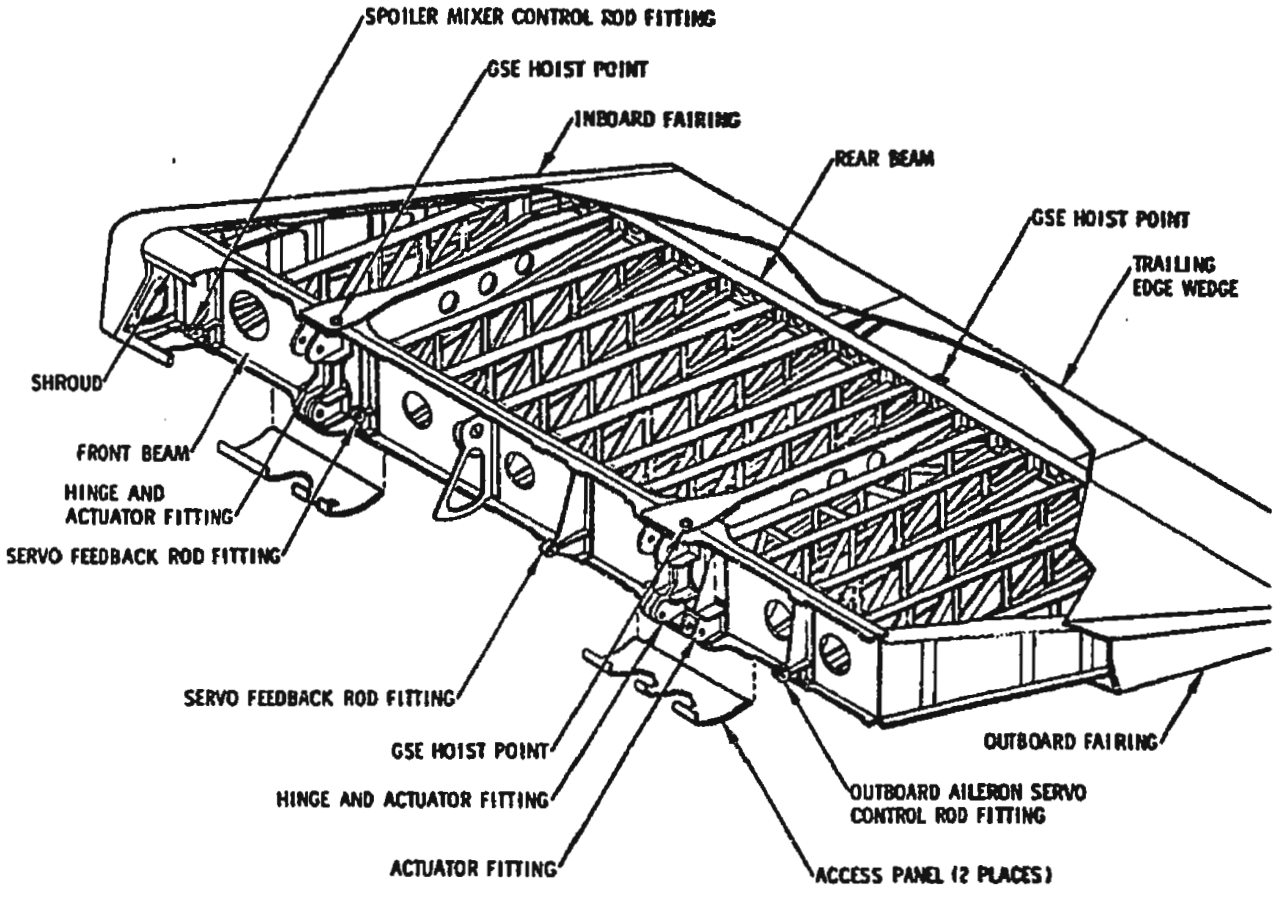
1. General

The inboard aileron (Ref. Fig. 1 and 2) consists of a web and cap front beam assembly; an extruded I-section rear beam; ribs with stiffened sheet metal webs and extruded caps; truss-type airload ribs; forged aluminum hinge and actuator fittings; webbed end closure ribs; molded fiber glass fairing end caps; aluminum upper and lower skin panels; and a crushed aluminum honeycomb core trailing edge wedge. The lower skin panels are interchangeable and attached with flush screws. Aileron leading edge shroud fairings are riveted to the aileron front beam. The fairings are made of two layers of metal bonded together and stabilized by formed sheet metal nose ribs. The outboard aileron construction and attachment features are the same as those described for the inboard aileron.

On aircraft 034, 035,
an Advanced Composite Aileron is used. This aileron uses graphite epoxy tape and graphite epoxy fabric for the aileron covers, ribs, and front spar. The forged aluminum hinge and actuator fittings and aluminum sheet leading edge shroud are basically the same as on the aluminum aileron. The trailing edge wedge is fabricated from Kevlar material having a Nomex core.

CR NOTE: The inboard ailerons installed on aircraft 31034 and
CR 31035 are constructed of advanced composite materials,
CR for the purpose of a service evaluation program in which
CR Lockheed (LCC) is participating under NASA sponsorship.

CR In the event of damage to a composite aileron, or
CR detection of any questionable condition, Engineering must
CR be contacted prior to further flight. Lockheed must also
CR subsequently be advised through their Resident Service
CR Manager at MCI. If visually detected damage requires NDT
CR verification, an ultrasonic procedure is contained in the
CR L1011 NDT manual, part 4, chapter/section 57-55-00, pages
CR 1 thru 5.



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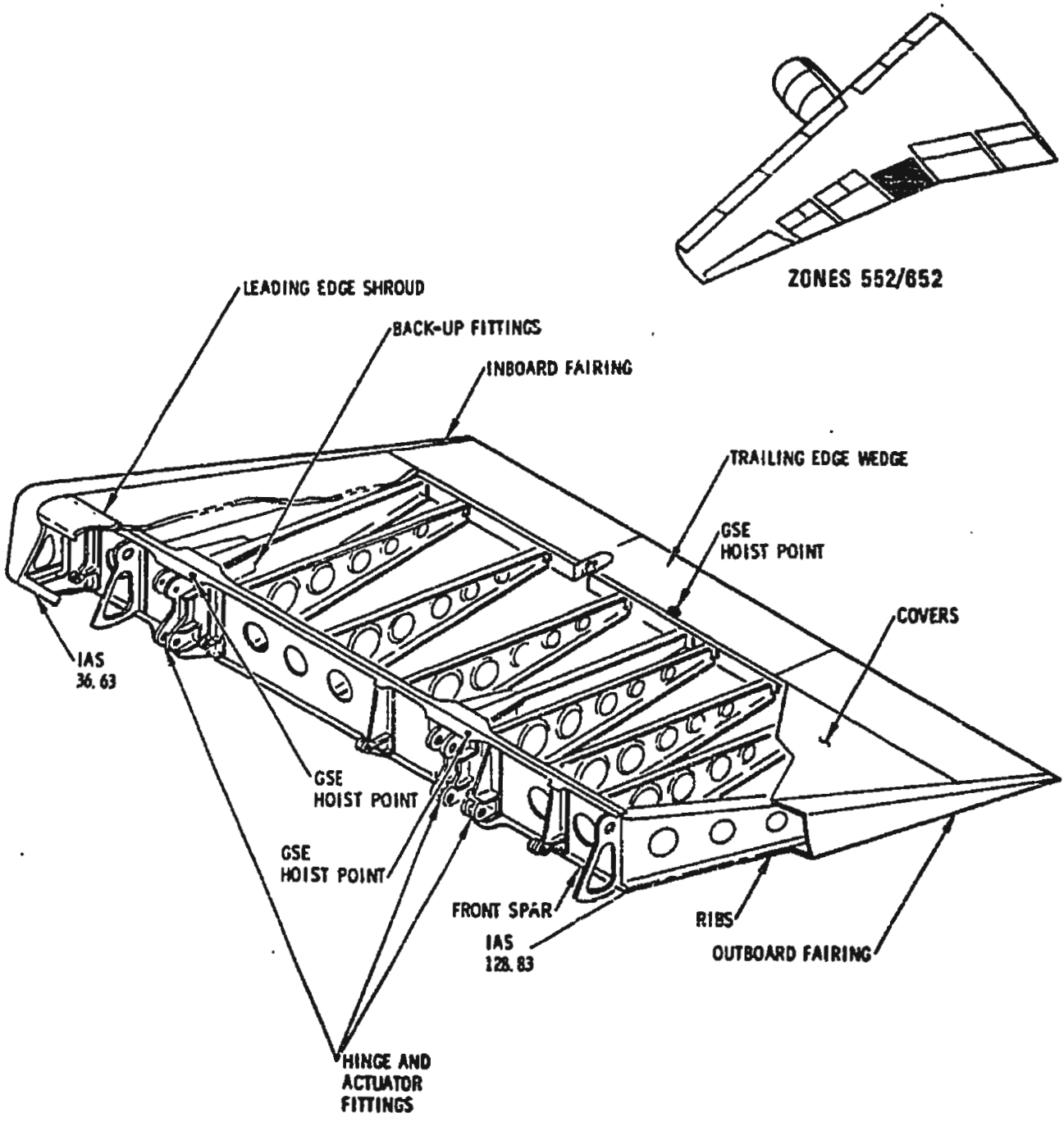
Inboard Ailerons
Figure 1

EFFECTIVITY: ALL

050B



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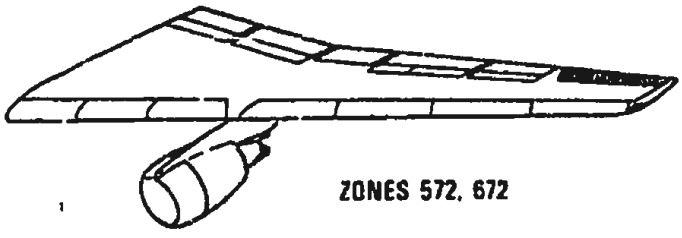
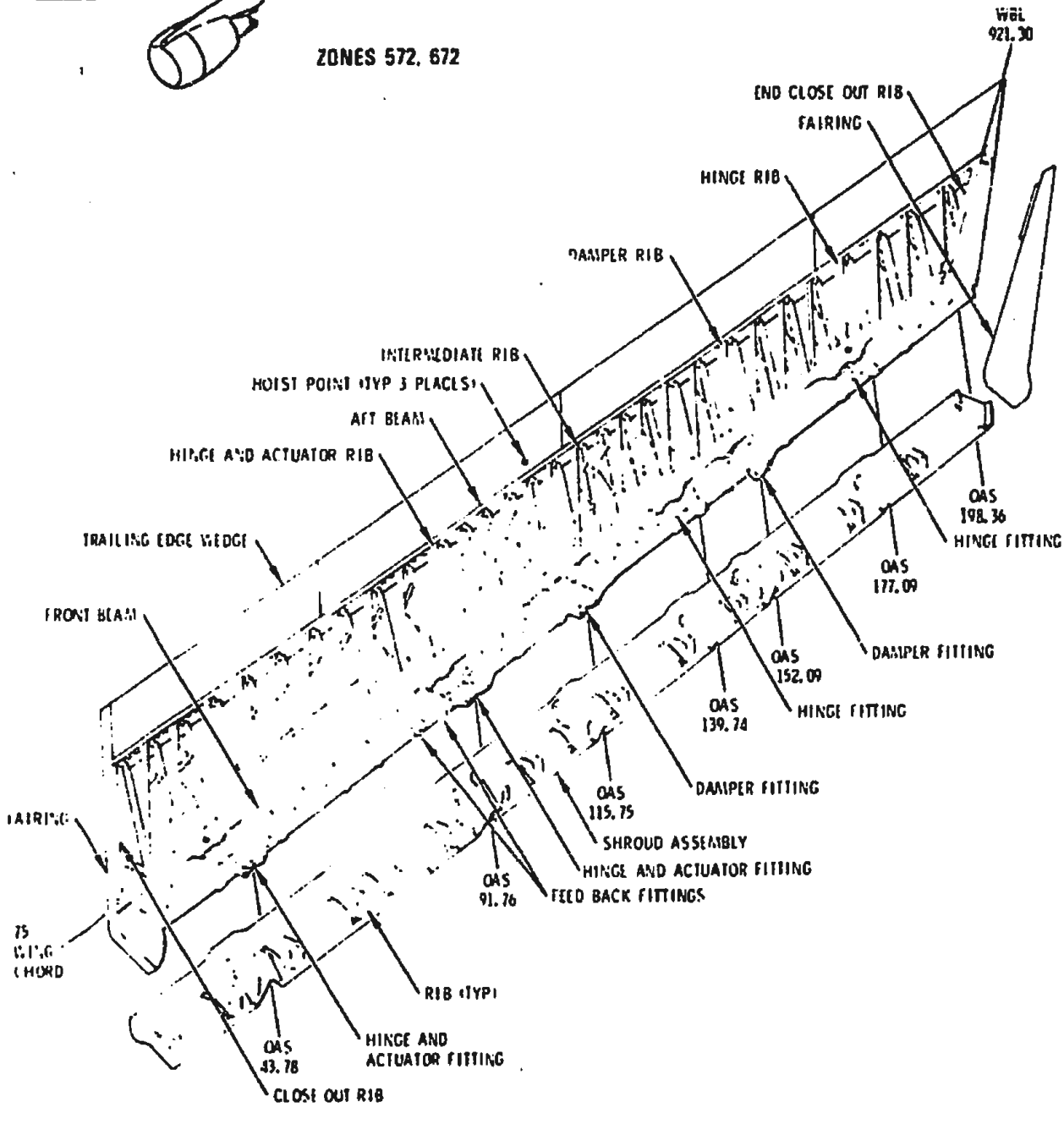
R R Inboard Advanced Composite Ailerons
Figure 1



ZONES 572, 672



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Outboard Ailerons
Figure 2

R

SACRIFICIAL ANODIC PLATE - REMOVAL AND INSTALLATION

1. General

This procedure describes the removal and installation of sacrificial anodic plates, located at the outboard trailing edge of left and right outboard aileron trailing edge wedge, at WBL (Wing butt line) 920.0 L or R (approx), in zones 572 and 672.

The sacrificial anodic plate is installed for the purpose of absorbing the damaging effects associated with lightning strike activity.

2. Referenced Procedure

LCP 77-1028 Chemical Film Protective Treatment, Clear, Non-Immersion, for Clad Aluminum Alloys

3. Removal/Installation

A. Removal

(1) Remove three tri-wing screws and remove plate.

B. Installation

NOTE: The sacrificial anodic plates are made of 7075-T6 clad aluminum alloy, 0.080 in. thick. They should be bare on the outer surface and finished with a clear chemical film on the faying surface (Ref. LCP77-1028). The plates are 4.82 in. long and 3.35 in. wide. The aft edge corners should be rounded to a 1.0-inch radius.

(1) Install sacrificial anodic plate on outboard aileron using three triwing screws.